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STARKWEATHER RUIN: A MOGOLLON-PUEBLO SITE
IN THE UPPER GILA AREA OF NEW MEXICO, AND
AFFILIATIVE ASPECTS OF THE MOGOLLON CULTURE

A DISSERTATION SUBMITTED TO THE FAC-
ULTY OF THE DIVISION OF THE SOCIAL SCI-
ENCES IN CANDIDACY FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY.

DEPARTMENT OF ANTHROPOLOGY

1938

By

PAUL H. NESBITT

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PREFACE

This publication deals with the recently recognized Mogollon culture in the Southwest. The introductory chapter and the conclusions are intended for the general reader while the intervening chapters describe the technical aspects of the excavations and will be of interest to specialists in the field.

This volume covers the work of the seasons 1935 and 1936 at Starkweather ruin near Reserve, New Mexico. In this work the Logan Museum was assisted financially by the late Dr. Frank G. Logan, Mrs. Frank G. Logan, the Board of Trustees of Beloit College, and several individuals.

To the residents of Reserve, New Mexico, I wish to express my appreciation for their many courtesies. To Mr. and Mrs. William S. Hudson I am especially indebted for the privilege of excavating on their property.

Each season a group of undergraduate students participated in the excavations and rendered invaluable assistance. Among this group, Shirley Kretschmer, Barbara Rivet, Andrew Whiteford and John Bennett were particularly helpful.

Beloit, Wisconsin.

PAUL H. NESBITT

May 1, 1938.



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SECTION I

STARKWEATHER RUIN

A Mogollon-Pueblo Site in the Upper Gila Area of New Mexico.

INTRODUCTION

The archaeological field of the Southwest comprises the present political boundaries of the states of New Mexico, Arizona, Utah, southwestern Colorado, eastern Nevada, western Texas and a large portion of the district of Chihuahua in northern Mexico. For more than a half century many field workers have concentrated their efforts to an unfolding of the cultural history of the area. Although early investigators were interested primarily in the collection of materials for museum purposes the excavations that have been conducted in recent years have had as their objective the solution of the many problems of cultural growth which this area presents. Kidder, Guernsey, Roberts, Morris and others have been instrumental in placing the archaeology of the northern half of the area on a firm basis while Gladwin, Haury, and Sayles have contributed significantly to our knowledge of the southern half. As the accumulated data from numerous investigators began to take form it became apparent that the area as a whole was not culturally homogeneous. Not only were the antiquities of varying ages but there were marked regional differences even within the same time periods. On the basis of these studies there is now postulated for the area two major culture provinces. In the plateau area of the north, the Basketmaker-Pueblo, and in the desert area of the south, the Hohokam. Each of these is considered a cultural unit with several stages in its development.

The remains of the Basketmaker-Pueblo are found in the plateau areas of the Southwest which includes southern Utah, eastern Nevada and the territory of the San Juan, Rio Grande, Upper Gila, Salt, and Little Colorado river drainages in Arizona and New Mexico. From the numerous investigations that have been conducted in this area certain historical reconstructions have been made. Significant in this connection was the adoption of the Pecos classification which has not only facilitated study and description of remains but has simplified discussion. In the Pecos classification two main headings are recognized, Basketmaker and Pueblo. The Basketmaker is further subdivided into three periods and the Pueblo into five as follows:*

- Basketmaker I. Nomadic and for the most part highly postulated.
- II. Beginnings of agriculture.
- III. Agriculture-pottery-house building complex.

* In 1935, Roberts suggested the following terminology: Basketmaker, Modified Basketmaker, Developmental Pueblo, Great Pueblo, Regressive Pueblo and Historic Pueblo. In this paper the older terminology is used for easier comparison with the present literature.

Pueblo

- I. Migrant peoples entering the Southwest and introducing new elements of culture.
- II. Small house period accompanied by ceramic changes.
- III. Development of large urban centers.
- IV. Period of decadence; shifting of urban centers.
- V. The Modern Pueblos.

The plateau region as a whole saw the former presence in the Southwest of a nomadic people thinly dispersed and lacking knowledge of agriculture and pottery. Their subsistence was to a large degree derived from hunting and food gathering. From this hypothetical Basketmaker I stage there developed in the course of several centuries the Basketmaker II culture, one more concentrated in territorial structure as is evidenced by the partial replacement of hunting by corn and other agricultural products. The work of Kidder,¹ Guernsey,² and Morris³ indicates that they were a semi-hunting, semi-agricultural people who apparently built no permanent houses and had no pottery. They depended to a large extent upon the natural caves of the region for shelters and in the floors of these caves dug storage-pits for corn and squash. Often these same pits were used for burial purposes. Paramount among their skilled crafts were basketry, and twined and woven materials comprising ropes, sandals, head-bands, and sashes. Their weapons and tools consisted of clubs, javelins used in conjunction with the atlatl, stone knives and scrapers and wooden implements for planting corn. The bow and arrow was apparently unknown. Near the end of this period the idea of making clay containers developed. This was not a true pottery for the vessels were crude and unfired and made by moulding clay against baskets. The idea of making pottery is probably southern in origin although its development in the Southwest seems to be local.⁴

Ultimately the Basketmaker people became firmly established sedentary groups drawing largely upon agricultural products for their food supply, making true pottery, and constructing pit-dwellings of pole, brush and plaster coverings. These developments marked the beginning of Basketmaker III. During this stage dwellings of the circular, oval, or rectangular pit variety were constructed. Ceramics progressed to a point where painted decoration made its appearance, the designs consisting of elements copied from baskets. The atlatl and grooved clubs continued in use but towards the end of the horizon the bow and arrow appeared. Indications are that the Basketmakers reached their highest development in the San

1. Kidder, 1919; 1924.

2. Guernsey, 1931.

3. Morris, 1919.

4. Morris, 1927.

Juan region and they are also known to have occupied parts of Utah, New Mexico, Colorado and Nevada. Skeletal remains indicate that the Basketmaker people were non-mongoloid in character, the dominant physical type being long-headed, intermediate to long-faced, and having medium to broad noses. In general they were a robust and rugged type.

The beginning of the Pueblo era was marked by several new features. Towards the end of the Basketmaker stage and the early part of Pueblo I there arrived in the Southwest a new group of people different physically from their predecessors. They were a round-headed or brachycephalic people who practiced cranial deformation through use of the cradle board. This period likewise witnessed an advance in many industries. The crude one-room pit structures of the Basketmaker gave way to dwellings composed of several contiguous rooms, the upper walls of which were constructed of stone masonry. In the San Juan area the structures had only slightly depressed floors and the major portion of the house was above ground. In the peripheral districts, however, the deep-pit excavation continued in use, some with roof entrances and some with side entrances. Where entrance was through the roof the former side passage was retained in reduced size as a ventilator. In the nuclear district kivas or ceremonial chambers continued as subterranean structures. The bow and arrow was the primary weapon, basketry continued in importance and cotton cloth made its appearance. New and significant pottery trends set in with the period as a whole being marked by a great diversity in vessel forms and in decorated wares. The slip was introduced and plain gray, black-on-white, black-on-red and polished interior bowls were important as non-culinary wares. Culinary wares showed corrugations and neck-banding, features not found in earlier ceramic horizons. These wares were not universal throughout the whole area for different regions exhibited minor variations. For example the eastern portion of the area had an iron carbon paint which was applied after the surface of the vessel was polished. The western portion of the area had a carbon paint which was applied before the polishing process was completed and this produced in the design a faded appearance.

Pueblo II was marked by the widespread distribution of peoples in small villages of from four to fourteen rooms. The rooms were single-story in height and were grouped in variable ways. Walls consisted of stone and adobe and were entirely above ground. Near the center of the area subterranean kivas persisted and were units detached from the domestic domiciles. In the marginal parts of the area the architecture was, by comparison, inferior, and in some districts the rectangular pithouses

survived through this period.⁵ In pottery the painted wares continued to exhibit a wide variety of forms and new decorative motifs were added to those of the preceding stage. Non-culinary wares became even more abundant as did also the culinary. In the latter ware several noteworthy developments were made including the beginning of the spiral coil, all-over corrugations, and indented, incised and pinched corrugations.

The Pueblo peoples attained their cultural peak in Pueblo III, generally accepted as the greatest period in the Southwest. It was during this classic stage that the great urban centers of Pueblo Bonito,⁶ Cliff Palace,⁷ Chetro Ketl, Aztec, and others were thriving. It was a period in which specialization was marked and each center became a region for new developments. By the regional differences in pottery, architecture, and minor antiquities, Kidder⁸ was able to designate several distinct sub-areas for the Southwest such as Rio Grande, San Juan, Mimbres, Upper Gila, etc. The general belief is that the impetus behind this rise of urban centers was the desire to concentrate in certain centers for purpose of protection, protection against the constant pressure of such nomadic tribes as the Navajo and the Apache. For a considerable time these urban centers flourished but in the end they began to collapse. Factors responsible for this were, no doubt, multiple. There were long periods of drouths⁹ that brought crop failures which necessitated shifting; internal discord and encroachment of plundering nomads may also have been factors. Regardless of what the actual causes may have been the large urban centers were abandoned, peoples drifted southward and new communities began to spring up along the Rio Grande and the Little Colorado rivers. It was here that the Spaniards found them in the middle of the 16th century, apparently headed toward a new renaissance. Intervention by the Spaniards and other Europeans soon brought about the complete subjugation of the Pueblo peoples and put an end to further development. Today we find the descendants of these prehistoric people in the numerous villages which dot the Rio Grande river, and in the area to the west in New Mexico and Arizona.

Dendrochronology has given to us the length of time for the unfolding of the Basketmaker-Pueblo pattern.¹⁰ At the present time it may be said that the Basketmaker culture had its beginnings about the time of Christ and extended until late in the 7th century when it was replaced by Pueblo

5. Nesbitt, 1931; Cosgrove, 1932; Colton and Hargrave, 1933.

6. Pepper, 1920.

7. Fewkes, 1910, 1911.

8. Kidder, 1924.

9. Douglass, 1929; Haury, 1934.

10. Douglass, 1929, 1932, 1935.

I. Pueblo I is believed to have covered the time period between 700 and 900; Pueblo II from 900 to 1100; Pueblo III from 1050 to 1300; Pueblo IV from 1300 to 1700 and Pueblo V from 1700 to the present.

The second major province in the Southwest is the Hohokam located in the desert region between the Colorado river on the west and the New Mexico border on the east and along a north-south axis from Flagstaff, Arizona to northern Sonora. The center of the area is the Middle Gila basin. Excavations in this area over the past eight years have emphasized the fact that the remains are non-puebloan in character and as such constitute a separate pattern. Within this cultural unit several developmental stages have been recognized. The Globe classification¹¹ lists these stages as Pioneer, Colonial, Sedentary, Classic, Recent and Modern.

The recent excavations at Snaketown,¹² Arizona have revealed to us the basic characteristics of the Pioneer period. It is Gladwin's¹³ belief that the Hohokam were originally a long-headed people who lived in eastern New Mexico or western Texas from late glacial times up to 500 B.C. They moved out of this region into Arizona when the pressure of groups bearing the new Cordilleran complex began to arrive. When the Hohokam finally become established in southern Arizona we find them an agricultural people who lived in large square pithouses having side entrances. Pottery was confined to unpainted wares in which plain and red types were predominant. Burial was by pit-cremation and for this reason data is lacking on the physical type. Four phases have been identified for the Pioneer period: Vahki, Estrella, Sweetwater and Snaketown. For each phase Gladwin arbitrarily allots 200 years.

Following the Pioneer is the Colonial period which is marked by new changes and developments in housetypes and pottery. Houses became considerably reduced in size and took on a rectangular form. The upper walls of these pithouses consisted of poles, brush, and mud and frequently the subterranean floor was elevated by means of stone posts.¹⁴ The houses were of the single-unit type and were grouped into villages which were widely scattered over the desert region. Painted pottery in the form of red-on-buff made its appearance. Agriculture continued to develop and the fields were irrigated by a well developed ditch system.

With the unfolding of the Hohokam pattern other changes were made and the Sedentary period of the Hohokam is marked by the introduction of

11. Gladwin, 1934.

12. Gladwin, Haury, Sayles, and Gladwin, 1937.

13. Gladwin, 1937.

14. Haury, 1932.

several new features. Rectangular surface structures made their appearance and exist along with rectangular pithouses as the characteristic room type. These houses were grouped into villages which were frequently enclosed in an encircling wall. The villages of this period lack the wide geographical distribution of the former stage, indicating the concentration of the people within a smaller area. Burial continued to be by cremation but the ashes were placed in urns rather than in pits. There was a continued development in pottery and decorative motifs and vessel shapes became numerous. Unique in this period is the presence of ball courts which in their general features are similar to those of Middle America.

Following the Sedentary is the Classic period which is marked by the invasion of Pueblo peoples into the Hohokam province. There was little intermingling, however, of the Hohokam and Pueblo cultures and each retained its distinctive features. Apparently this invasion from the north was a temporary one, probably not lasting more than a century.¹⁵ During their stay in the desert region the Pueblo peoples constructed multi-storied communal dwellings, such as that of Casa Grande,¹⁶ made typical pueblo pottery and clung to the northern burial custom of inhumation. At the same time the Hohokam continued to dwell in pithouses and single-story surface rooms, developed further the red-on-buff pottery, and disposed of the dead by urn cremation. Agriculture, aided by a widespread network of irrigation ditches radiating from the Salt and Gila river valleys, reached its maximum development. Before the end of this stage the Pueblo peoples withdrew, leaving again the Hohokam as the sole rulers of the desert.

The final stages of the Hohokam are not well known. The Recent is a highly postulated stage with which no correlation of remains has yet been made while the last stage, the Modern, is believed to comprise the present day Pima and Papago peoples.

In general the stages of the Hohokam correlate chronologically with the Basketmaker-Pueblo periods. Approximately contemporaneous are Pioneer and Basketmaker I-III, Colonial and Pueblo I-II, Sedentary and Pueblo II-III, Classic and Pueblo III-IV, Recent and Pueblo IV (late) and Modern and Pueblo V.

Contrasting the culture characteristics of the two major provinces, the Basketmaker-Pueblo and Hohokam, a number of noteworthy differences are to be noted which briefly summarized are as follows:

15. Gladwin, 1935.

16. Fewkes, 1912.

Hohokam

Cremation.

Rectangular single-unit pithouses.

Use of pole, brush, and plaster in room construction.

Extensive irrigation.

Coiled pottery plus paddle and anvil technic.

Painted pottery primarily red-on-buff.

Extensive carving in shell.

Three-quarter grooved, long-bitted axe.

Turkey not domesticated. No ceremonial chambers.

Ball courts.

Thus far no close connection has been established between these basic groups. Their patterns seem to have developed independently and to have been governed strongly by environmental conditions.

Recently Haury¹⁷ discovered certain cultural manifestations in southwestern New Mexico which he was unable to relate to either the Basketmaker-Pueblo or the Hohokam as these two are now defined. To this culture he assigned various divisions and dates as follows: Georgetown 500-700 A.D.; San Francisco 700-900 A.D. and Three Circle 900-1000 A.D. There were changes from stage to stage in house types, pottery, minor arti-

Basketmaker-Pueblo

Inhumation.

Progression from circular and rectangular pithouses to multi-storied communal dwellings.

Progression from pole, brush and plaster to coursed stone masonry.

Dry farming; small use only of irrigation.

Coiled pottery plus surface scraping and smoothing.

Painted pottery primarily black - on - white and polychrome.

Shell carving rare. Full - grooved, short - bitted axe.

Turkey domesticated.

Ceremonial chamber or kiva in pueblo horizon.

Ball courts absent.

17. Haury, 1936.

facts, and disposal of the dead. House types progressed from round to rectangular pitrooms, burial was by inhumation and the physical type was found to be an undeformed brachycephalic type with low cranial vault.

Haury proceeded to compare this culture manifestation with the Basketmaker-Pueblo, the Hohokam, and certain eastern cultures designated as Caddoan. He concluded that the pattern is neither Basketmaker or Hohokam and that the only logical solution rests in the recognition of a third cultural division, the Mogollon. Through culture traits and physical type, diagnosed as eastern in complexion, ultimate relationship with the Caddoan is suggested.

In order to obtain more information on the Mogollon culture, the writer, in 1935 and 1936, undertook excavations at the Starkweather ruin near Reserve, New Mexico. The remains of 18 pithouses and a pueblo ruin, comprising 12 rooms, were uncovered. Evidences are that the pit-houses represent three different phases of the Mogollon culture, Georgetown, San Francisco, and Three Circle, and that the pueblo was built subsequent to these structures. The results of this investigation have led to certain conclusions considerably at variance to those advanced by Haury and Gladwin. Briefly stated the writer holds that:

1. The Mogollon culture is Southwestern in character and does not represent a new cultural division. Its elements are broadly similar and in many cases identical with the Basketmaker-Pueblo pattern, and there is infiltration of some ideas from the Hohokam.
2. The Mogollon, Hohokam, and Basketmaker-Pueblo derived certain ceramic types from the same source, a source which has to date not been identified.
3. The first settlements made in New Mexico by the Mogollon peoples took place in Pueblo I period, 700-900 A.D.
4. The evidence thus far available on the Mogollon culture and the Mogollon physical type does not warrant correlation with any specific eastern group such as the Caddoan.

In the pages which follow a detailed description of the excavations at Starkweather is given. Then comes a discussion of Mogollon culture affiliations and finally conclusions and suggestions are drawn from this data.

CHAPTER I.

STARKWEATHER RUIN: PITHOUSE REMAINS

The Starkweather ruin (Plate 1, 2a) is situated on the William S. Hudson ranch, 3.5 miles west of Reserve, Catron county, New Mexico, in Section 3, Range 19 west, Township 7 south. The site occupies the west section of a small mesa which towers approximately eighty meters above the San Francisco river situated three miles to the northeast, and forty meters above Starkweather canyon directly to the south. The mesa is about 1850 meters above sea level. The ruin is easily accessible from all directions except the south, and is situated sufficiently above the surrounding terrain to give an unobstructed view of the regions to the north and east. On the south and west the view is obstructed by the Apache National Forest which here and there has encroached upon the ruin. Rancher Hudson states that the forest has encroached in a northern and eastern direction a distance of two miles since his arrival at Reserve in 1885. To the east and south rise the Tularosa and Saliza mountains, and to the west the San Francisco mountains with several peaks over 8500 feet. Although the whole countryside is rugged in topography, there are sufficient level plains bordering the Starkweather canyon and the San Francisco valley to allow the cultivation of food plants. At the present time rancher Hudson has about 50 acres under cultivation. Water from the river is stored in a reservoir and used to irrigate the fields.

The region is one in which grass is plentiful and judging from the number of animal bones scattered throughout the refuse of the ruin, game animals provided the peoples of Starkweather an important source of food. Animals identified from bones found in the ruin and now known to exist in the region are among others the Coyote, Fox, Mountain Lion, Bob-Cat, Squirrel, Jack rabbit and Cotton tail rabbit, Mule deer, Antelope, Turkey, Wolf and Porcupine.

The mesa upon which the ruin is located is covered with patches of grass, occasional cacti, clusters of juniper and pinyon and a few pines. The adjoining territory to the west and south is heavily wooded with Ponderosa pines towering forty feet or more in height, Juniper, Pinyon and Oak. Along the San Francisco river are numerous cottonwoods and willows. The Rocky Mountain Beeweed is to be found almost everywhere except in the heavily wooded area.

The top of the mesa housing Starkweather ruin measures approximately 400 meters east and west and 150 meters along the north-south axis. Before excavations were begun evidences of occupation were to be found in irregularly-shaped stones in alignment outlining rooms, shallow depressions marking pithouses, potsherds on the surface and fragments of flint chips and stone tools.

Thirty-two houses were excavated, twelve pueblo surface houses and twenty pitrooms. The pit-structures were irregularly situated in relation to one another with no apparent regard for plan (See map). The pueblo rooms, on the other hand, formed a distinct unit with a well defined plan of arrangement.

For convenience, throughout the detailed description of the house remains, the terms pithouse and pueblo will be employed. Likewise to facilitate description, the house remains have been classified into types on the basis of form, function, and architectural features. Their chronological order has been based primarily upon ceramics, the evidences for which are presented later in this report. The classification of house types follows:

- Type I. Pithouse: Round, domestic house with lateral entrance.
 - II. Pithouse: Round, domestic house with roof entrance.
 - III. Pithouse: Rectangular, domestic house with lateral entrance.
 - IV. Pithouse: Round, ceremonial house with stepped entrance.
 - V. Pueblo: Rectangular houses with stone and adobe masonry.
- Subtypes:
- a. Domestic house with hatch entrance.
 - b. Storeroom with doorway.
 - c. Ceremonial with hatch entrance.

TYPE I PITHOUSES

House A: (Plates 2b, 9a, b, figure 1).

House No. A is the largest of this type and in most respects is representative of the six rooms falling into this class. The diameter of the pit varies from 15 feet to 16 feet and has an average depth of 3 feet 6 inches below the humus layer. Floor features consist of four postholes, averaging more than 14 inches in diameter and sunk below the floor to a depth of 1 foot 6 inches. These roof supports had been placed in the corners of the room approximately in the directions of the four cardinal points. Nothing was found to indicate either the height of these upright timbers or their shapes. It seems likely that they were seven to eight feet in height and forked at the upper ends in order to serve as a suitable resting place for the

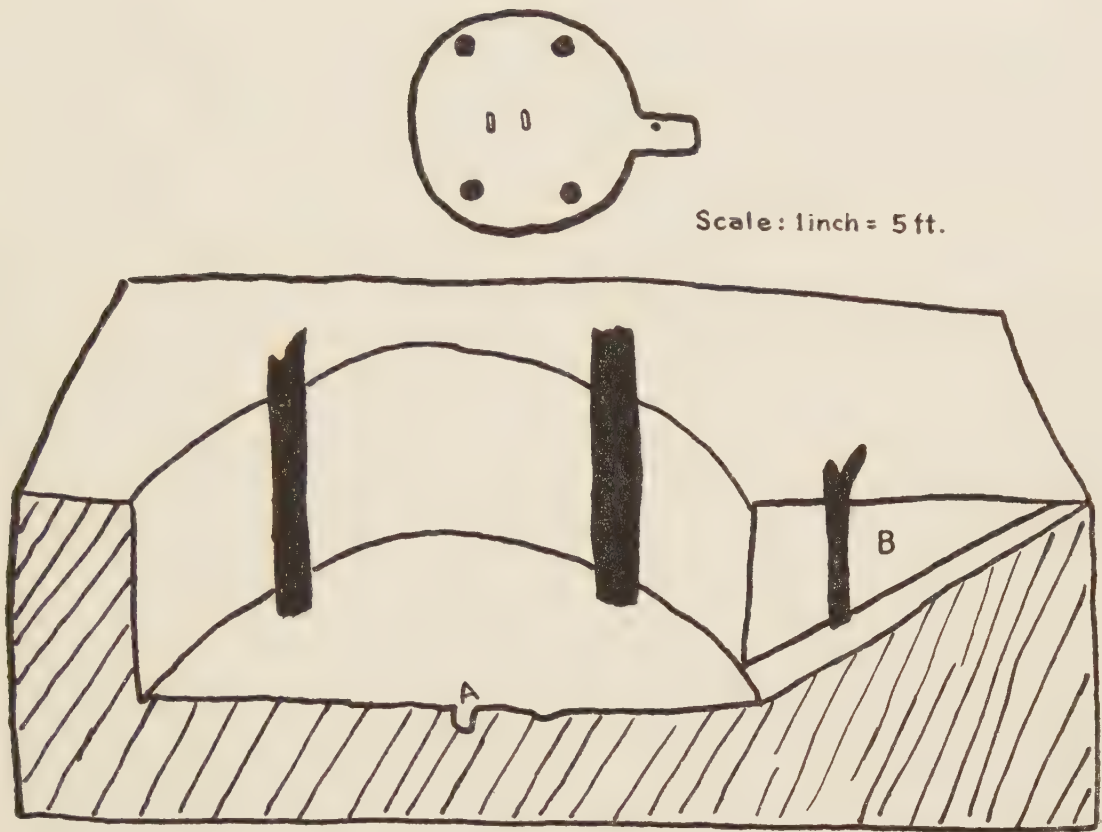


FIGURE 1.

Plan and Section of House A.
A, Trough in floor; B, Side entrance.

cross beams. The cross-beams formed a rectangular framework against which were placed smaller poles. These were imbedded in earth at the ground level around the periphery of the pit, and formed the upper half of the walls of the house. The rectangular space was covered with cross poles and a small opening was left in the center to serve as a smoke hole since the lateral entryway would act also as a ventilator. The framework of the house was then covered with small branches, bark, and leaves and a thick coating of earth or adobe. Several cakes of hardened adobe were found on the floor, many of which showed the imprints of roof materials.

The subterranean walls of the rooms were formed of the natural sub-soil which consisted of gravel and clay. In none of the pit-structures was there any evidence that the occupants had any knowledge of the value of vertically laid stone slabs. Plaster had been applied to the native floor but the walls were untreated.

There were several cache holes in the floor which may have served as storage places for small objects. There was no evidence of fire hearths such as those found by Haury at Mogollon and Harris villages.

A distinctive characteristic of all houses of Type I is the lateral entry-way on the east side. In house No. A it pointed directly east and at the most was a rather crude affair. The entry was a short raised passage that ran from the floor level to the outside ground level, the incline being at about a 20 degree angle. It was roofed in much the same fashion as the main dwelling except that there were no permanent interior support timbers. Because of its small size and narrow width, which was 2 feet 4 inches, the poles could be sloped from the sides to the center and be sufficient to carry the weight of the roof materials without additional interior supports.

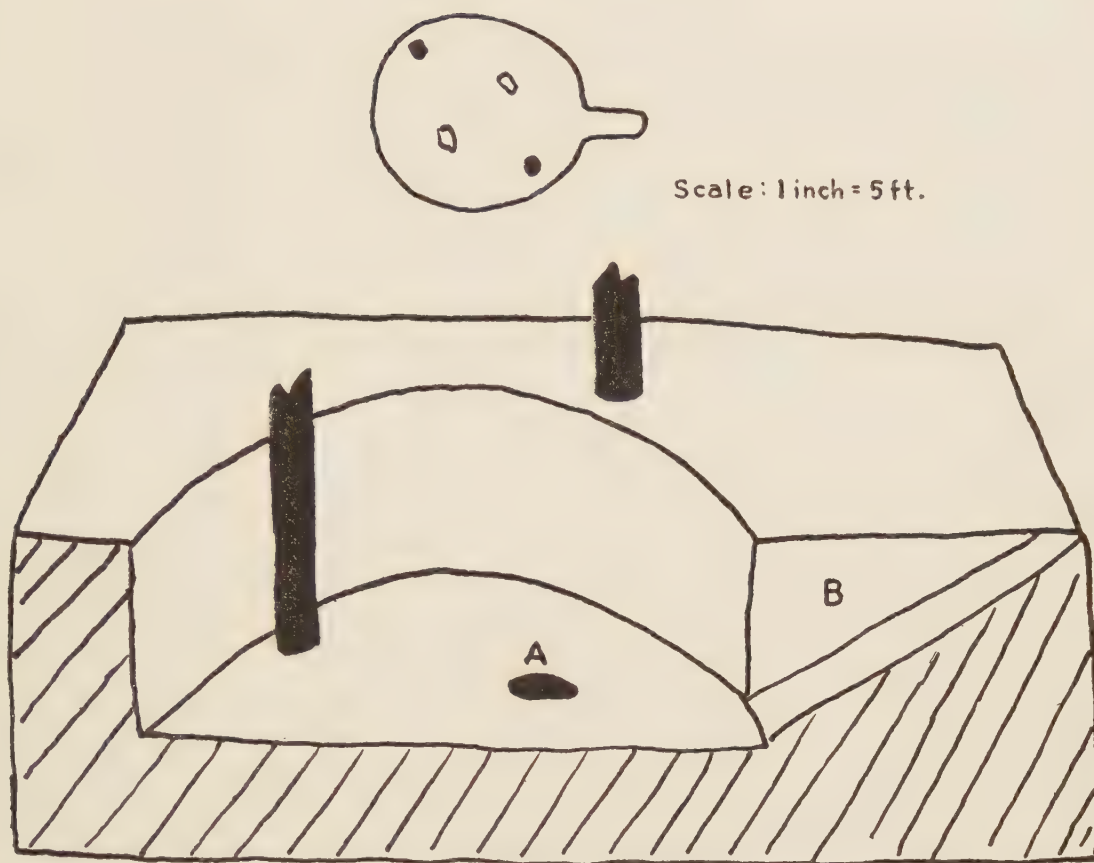
On the floor, at the north and south sides of the center of the room, two parallel troughs constitute an odd feature, perhaps concerned with the construction of the roof. Two small flat stones, located at diagonal ends of the troughs may have been bases for support timbers.

More than the usual amount of debris was found in the room and an irregular mound of refuse, 10 inches to 18 inches high, capped this. Here then was an accumulated refuse about 5 feet in depth which afforded excellent opportunity for the application of stratigraphical methods in the determination of pottery sequence. The mound of refuse and that of the room itself was excavated in five arbitrary levels, each of which revealed significant diagnostic features which together with architectural features made possible the relative dating of all pitstructures at Starkweather. The application and results of this stratigraphic test are described on page 79. and following.

House C: (Plates 2b, 19a, 20b, figure 2).

House No. C conforms to the same general type as house No. A although it is somewhat smaller. The depth of the pit is somewhat less than that of the house just described, measuring 3 feet 2 inches along the west wall. In form the house approximates a circle, varying in diameter from 13 feet 6 inches to 14 feet.

Floor features consist of two postholes, 10 and 11 inches in diameter, placed at the southeast and northwest corners of the room. Their depths were considerably less than those of house A. The removal of two support posts from the interior of the room suggests that the occupants had taken advantage of obtaining more floor space by placing the supports either in the wall or near the surface at the periphery of the excavation. Other architectural features were similar to those of the other structures includ-

**FIGURE 2.**

Plan and Section of House C (also typical of F).

A, Floor pit; B, Side entrance.

ed within Type I pitrooms, in that the lower walls showed no plaster, absence of fire hearth and slab masonry, frequent cache pits, plastered floor and lateral entryway. The passageway faced east and measured 2 feet 3 inches wide and approximately 5 feet 3 inches in length.

Five burials were found in the upper refuse of the house, all of later date than the house itself. They were accompanied by mortuary pottery of a type found only in the pueblo structure. One burial, number 30, was that of a pitroom dweller. It was situated at a depth of 2 feet 8 inches below the floor of the room, and after burial the floor had been repaired.

House F: (Plate 3, figure 2).

This house displayed several obvious similarities to room C, namely—slightly flaring walls, lateral entryway, absence of firehearth, untreated walls, and plastered floor. Two circular Pueblo III graves had been exca-

vated in the fill of the room and the skeletons had been partially removed and scattered, possibly by rodents. The depth of the excavation was shallow, approximately 2 feet 8 inches, and in this respect it is like house C. Two postholes, one considerably larger than the other, occupied the northwest and southeast corners of the room. This again suggests the removal of interior support posts to allow for additional room space. The entryway faced the southeast and was somewhat wider than in houses A and C, measuring 2 feet 11 inches and 5 feet 1 inch in length. House F approached a true circle in shape, having a diameter ranging between 12 feet 8 inches and 13 feet.

House I: (Plate 20b).

From several different standpoints house I was an interesting structure. In general features it corresponded to those already described but in several specific details it revealed differences. The depth of the excavation was greater by a considerable margin with the floor slightly over 5 feet below ground level. This cannot be explained by a greater accumulation of refuse at this point, for observations at all pithouses showed the Pueblo III or Stonehouse refuse layer to be uniform in thickness and in no place except in the burial ground to the north and northeast more than 8 to 10 inches in thickness, and this includes the surface or humus layer. House I also differed in having five support posts, and walls which were crudely plastered with adobe. Here and there small pebbles were irregularly placed in the adobe. It is probable, however, that this is the natural make-up of the subsoil and the stones do not represent any attempt at true masonry. The floor, like the others described, had also been made smooth by an application of plaster. The fill of the room was largely made up of refuse dumped by the occupants of the pueblo and because of its great depth the room was excavated in three arbitrary levels. In the upper and middle levels sherds were numerous and one Pueblo II burial (No. 45 on map) was removed. The lower level, 1 foot 8 inches in thickness, showed fewer sherds, and the sandy texture of the soil suggested that it was mostly dirt-blown fill. The diameter of room I on the floor level was 13 feet 6 inches by 14 feet 1 inch. The passageway, situated on the east side of the room, flared outward, measuring 2 feet near the wall and 2 feet 10 inches where its ascending floor reached the ground level. The passageway measured 3 feet 7 inches in length. Three cache holes measuring 10, 11, and 13 inches respectively were located near the center of the room. The postholes, of which there were five, varied from 1 foot to 1 foot 2 inches in diameter. The presence of a fifth support in the northwest corner of the

room may be due to incorrect distribution of the roof materials causing the upper structure to sag at this point. In other respects the superstructure conformed to those houses already described.

House O: (Plate 8a).

This structure was very similar in its general aspects to the other circular pithouses in the village. It was somewhat smaller than some of those already described but in all other respects was a characteristic domicile. Room O was not found until after the excavation of stonehouses 7, 11, and 12. As in pitrooms P, Q, and R this superposition of room types was invaluable in showing both the temporal and culture relations of the early and late occupants of Starkweather Village. The builders of the pueblo had filled in the subterranean portion of pitroom O with ashes and other debris. They then leveled this off on an even plane with the surface, applied a heavy application of adobe and the whole served as a floor. Burial No. 51 was encountered in the fill of room O and it belonged to the pueblo horizon. The burial was that of an adult male and was not accompanied by mortuary furniture. The absence of both lower and upper leg bones and the presence of the foot bones presented a puzzling problem. The individual seems to have been interred in a flexed position resting on his back with the grave too shallow to prevent the knees from extending above the surface. When the stone houses were built these projecting bones interfered with the evenness of the floor and so were pulled out. For this reason it has been impossible to accurately date this burial for it seems to have been made prior to the erection of the stone dwellings but after refuse had been dumped into the pit excavation of room O. The floor of surface room No. 7 gave no indication that the adobe floor had been broken through, and then replastered, as would have been the case in a subfloor burial.

The walls of room O bowed slightly and were unplastered. The subsoil was a mixture of clay and gravel and the subterranean walls were untreated. The floor had had several applications of plaster and in the center of the room showed considerable tracings of ash and charcoal. The room was without a firepit; this feature is absent in all the rooms of this class. The superstructure was supported by four upright timbers, the holes of which were found in diagonal corners of the room. The roof was constructed in a fashion similar to the rooms already described. The lateral passageway faced to the southeast where it partially cut through the wall of pitroom P. So little remained of the passageway that it was impossible to determine its exact nature and its relation to the second pit structure. It

is quite possible that rooms O and P represent connected rooms of a single house such as that to be described later for pit-structures L and M. The entryway was unusually narrow though sufficiently wide to allow for adult entrance.

Room O was somewhat smaller than the other circular pitrooms, measuring but 7 feet 9 inches in diameter. The smallness of the room was likewise indicated in the size of the roof supports which, judging from the size of the holes, could not have been more than 5 or 6 inches in diameter. The depth of the excavation varied, being 2 feet 10 inches at the east wall and 3 feet 3 inches at the west wall. This seems to have been due in part to the general slope of the terrain at this portion of the mesa. The entryway was 2 feet 2 inches in diameter and in all probability was about 3 feet 6 inches in length although this could not be accurately determined.

House Q: (Plate 7a).

One of the most interesting problems encountered during the course of the excavations was in connection with House Q. It was found that a larger stone house with true masonry had been built directly over the pit excavation and that it had incorporated no portions of the latter in its construction. This superposition of house types was of great importance in determining the chronological relationships of the Pueblo III (Upper Gila) and Mogollon horizons. The rectangular stone house, more recent in construction, was discovered first, and only after it had been completely cleared of debris, were the suggestions of the earlier pithouse noted. To simplify discussion the stone house will be described under houses classified as Type V.

Pitroom Q was a fine example of the round and lateral entryway house type. The subterranean portions of the walls flared slightly outward and in spots showed plastering although the greater portion of the wall was untreated. Again it was found that the superstructure had been supported on four upright timbers, but here placed on a narrow bench surrounding the periphery of the room. This architectural arrangement, which allowed for greater room space, does not conform to other Type I houses in which the support posts are located in the house interior. House Q was the only pit structure having an encircling bench, an architectural feature more characteristic of the regions of the north. The bench which was 3 feet 3 inches in width encircled the entire room except for that portion near the passageway at the east wall. The fact that the main roof supports were situated on the bench suggests that the wall poles were placed at a somewhat wider periphery.

Other floor features include a shallow trough 4 feet in length, 1 foot 4 inches in width and ranging in depth from 4 to 6 inches. Several small flat stones rested in the bottom and there was some evidence of decayed and burned wood. This might suggest that additional support posts were situated here, but the presence of a large posthole directly above on the bench would make this improbable. There was no indication of cache holes ordinarily found in rooms of this type.

The excavation was full of debris dumped by the later occupants of the village and in this was found three badly decomposed burials, each associated with a number of pueblo mortuary offerings.

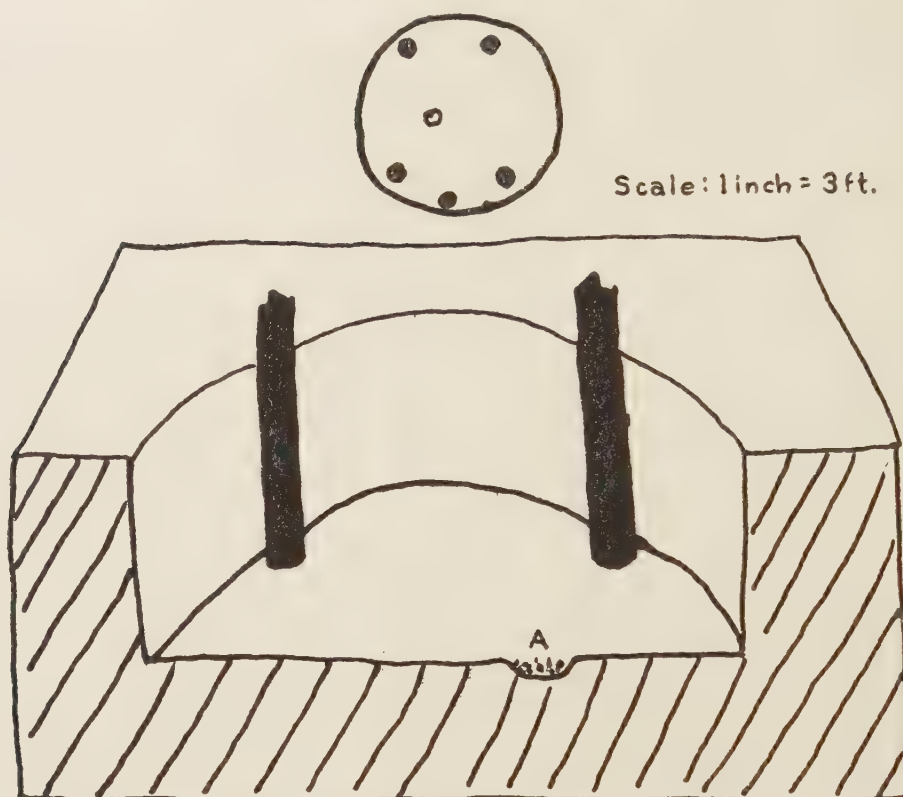
House Q was somewhat larger than the average Type I structure. At the floor level it measured 13 feet 3 inches in diameter and at the bench level 19 feet 4 inches. The bench was situated approximately 10 inches above the floor and it had an average width of 3 feet 3 inches. The height of the north wall averaged 2 feet 7 inches and the south wall 2 feet 9 inches. The passageway in the east wall was larger than in the rooms already considered, measuring 3 feet 2 inches in width and 7 feet 3 inches in length. It sloped upward at an angle approximating twenty degrees. The passage widened somewhat toward the east, measuring 3 feet 10 inches at its extremity near the surface.

TYPE II PITHOUSES: ROUND WITH ROOF ENTRANCE

Typical Houses: Nos. K, N, and P.

House K: (Plate 4a, figure 3).

House K is a good example of the structures of this type. Several important features distinguish House K from those already described. First and foremost is the absence of a lateral passageway and in its place a roof entrance. The house is also smaller in diameter than those having lateral entryway, and the pit excavation is considerably deeper. The walls are vertical rather than flared outward as in the Type I houses. The walls of the room were plastered on the east and north sides but the south and west walls lacked this treatment and were of natural subsoil facing. Originally there were five support posts, four located at diagonal ends of the room and a fifth support at the north end. More than a handful of decayed wood and charcoal was found in each. These posts had supported the roof and were probably equipped with forked tops to support the cross beams which in turn supported the small cross poles of the flat roof. In the flat roof an opening or hatch was left which acted both as an entryway and a smoke outlet. There was a rough circular firepit just to the east of the center of the room. It had been lined with small pebbles which were held together

**FIGURE 3.****Plan and Section of House K.****A, Fire pit.**

with adobe. Several feet northeast of the firepit was a small cache hole which contained several flint chips. Turning to the map it is to be noted that House K is located at the southeast periphery of the village. Because of this there was very little debris-fill in the room. Apparently the occupants of the pueblo dumped their refuse in that area more closely adjacent. House K measured 10 feet 1 inch along the north-south axis and 9 feet 3 inches along the east-west axis. The wall on the north side measured 4 feet 2 inches and on the south side 4 feet 1 inch. The firepit averaged 11 inches in diameter and was 4 inches deep. The cache hole was 9 inches in diameter and 6 inches deep. Judging from the poles the support posts seemed to have averaged about 8 inches and to have been set at a depth of 1 foot 5 inches.

House N: (Plate 4b).

Some of the most interesting problems encountered during the excavations was in connection with House N. The location of this house and

certain of its features have an important bearing on the chronological relations of the several house types found at Starkweather village. House N was situated below pueblo rooms 3 and 6. The west wall of Room 6 which separates it from Room 3 cut directly across the middle of House N. No finer evidence of superposition of rooms could be desired. The late occupants of Starkweather Village in erecting their houses filled into the ground level the excavations made by the earlier pitroom dwellers. After the erection of pueblo rooms 3 and 6, a portion of the old pitroom was excavated and this space used for a storage space and a mealing bin. To support that portion excavated below the true stone two upright supports were used. They extended vertically from the floor level of the pitroom to the base of the west wall. In other respects House N might be considered typical of the circular form of dwelling. The superstructure had been supported, as in the other rooms, on four posts in diagonal corners of the room. The floor showed a plaster coating but there was no evidence of it on the walls. The lateral entryway was absent and, unlike House K no firepit was present. Like House K, House N was small and quite simple in its interior features. It would seem that the inhabitants of the pit dwellings cared little about permanent fixtures for the interior; they were content merely with a shelter and, in some instances, a crude firepit. This might lead one to suspect that outside firepits might have been common but during the course of excavations only two were found, and it is quite possible that these were made and used by the later occupants of the village. House N was roughly oval rather than circular in form, and measured 8 feet 2 inches by 9 feet 2 inches at the floor level. The floor level of House N was 1 foot 4 inches below the floors of Rooms 3 and 6, and the excavation was 5 feet 4 inches below the surface. The west wall measured 5 feet 3 inches and the north wall 5 feet 6 inches. The support posts were imbedded 1 foot 4 inches into the floor and seem to have been about 8 inches in diameter. The postholes revealed only minute fragments of wood indicating that the supports may have been used later by the occupants of the stone houses.

House P: (Plate 8b).

Like House N, House P afforded interesting evidence of the relative age of the pit and stone houses. Pueblo rooms 8, 9, and 12 were built over House P with the north-south and east-west stone walls cutting it in midsection. An odd feature is its proximity to Pitroom O to the north, the lateral entryway of the latter cutting partially through the wall of House P. The fill of the pitroom revealed little refuse materials, for the nuclear section of the stone houses, of which Rooms 8 and 12 are a part, was built soon after the

arrival of the Pueblo II people. The fill consisted primarily of wind-blown sand and other materials intentionally brought in to fill the excavation so that stone walls might be built above it. One burial, number 52, an adult male, was found in the fill with pottery of Pueblo III age. When excavated, House P revealed features such as those already described for Houses K and N. The walls were unplastered and revealed no tendency to flare out. The floor was well defined, showing a liberal treatment of adobe and frequent tracings of charcoal. In spite of the latter, however, excavation failed to reveal a firepit. Although House O, a few feet to the south, is equipped with lateral entryway, trenches dug revealed none for House P. It is conceivable that these rooms were parts of a double room and both used the same entryway. However, the narrowness of the passage connecting these rooms is such, that it would have been quite impossible for an adult to get through. In form, the room is oval rather than circular as House K, the floor measurement being 9 feet 5 inches along the east-west axis and 7 feet 11 inches at the north-south axis. There were four holes in the floor which housed the support posts and, judging from the width of these holes and their depth, the posts were somewhat smaller than in the rooms already described. They must have measured, on the average, about 6 inches in diameter which would have been sufficient to support the superstructure of a room this size.

TYPE III PITHOUSES: RECTANGULAR WITH LATERAL ENTRANCE

Typical Houses: Nos. D, E, G, H, J, M, L and R.

The primary difference between houses of this class and those already described is in form. The houses are either square or rectangular and possess lateral entryway, whereas all circular houses do not have this feature. Other minor differences also exist which will be pointed out in the following house descriptions. Eight Type III houses were excavated at Starkweather ruin, and there seems to have been no plan of orientation, as the houses were found irregularly scattered on the mesa. They tend, however, to be located in a more restricted area than the other houses, and do not extend out to the periphery of the site. With the exception of House H, where the entryway is on the north-west side, all houses of this type have their passageways facing east. The indications are that these houses were used solely for domestic purposes.

House D: (Plate 2b).

This house is located a short distance east of the pueblo structure whose occupants made use of House D as a refuse bin and in this refuse, at a later time, placed two burials, numbers 35 and 36 (see map).

House D is characteristic of the general type of rectangular structure. When the fill of the house had been removed there was revealed an excavation rectangular in shape with a tendency to rounded corners. The walls bowed slightly outward and the pit was considerably more shallow than in houses of Types I and II. Plaster was irregularly distributed over the walls and the floor, the latter showing only a thin plaster coating over the native subsoil. On the east side of the room, a narrow and crude entrance-way was cut which inclined to the surface. The passageway was exceedingly narrow and an adult would have had considerable difficulty in getting through. A portion of the passageway had been cut away to make room for a late surface room burial.

The arrangement of the postholes in the floor suggested a different type of roof for the rectangular rooms. As has been pointed out, the circular rooms seem to have been furnished with flat roofs. In House D the floor posts are arranged through the long axis of the house. There were three support posts, one at the east wall near the passageway, one at the west wall, and one near the center. This arrangement suggests a low gable-type of roof with the entrance covered by an extension built out from the roof. Although there is nothing to indicate that such had been the case, it is highly probable that the upper ends of the three support posts had been forked to hold crossbeams. These cross-beams ran the entire length of the room and, against them, were placed the upper ends of small poles whose lower ends rested upon a smaller cross-beam held up by forked posts imbedded in the surface at the periphery of the excavation. Against these cross-beams were placed smaller poles whose lower ends were imbedded in the soil, and these formed the sloping walls of the house. This entire framework was then covered with cross poles, bark, leaves, earth, adobe and, lastly, a fine coating of plaster. Several fragments of wood, all juniper, were found on the floor and, may represent a portion of the superstructure. Careful brushing of the floor failed to reveal any evidence of a firepit such as those found by Haury¹⁸ at Mogollon village. House D had about the same floor space as was found in the circular dwellings. In form it was rectangular, being 10 feet 2 inches at the east-west axis and 8 feet 2 inches at the north-south axis. The depth of the excavation varied between 2 feet 6 inches and 2 feet 10 inches. The passageway (or ventilator?) was approximately 1 foot 3 inches wide and 7 feet in length. As has been previously indicated, it had been partially destroyed by an intrusive burial.

18. Haury, 1936.

Judging from the size of the postholes in the floor, the timber supports must have averaged about 9 inches in diameter.

House E:

House E, like D, had been rectangular in form and showed much in common with the first structure described. The house was situated well to the south side of the mesa where a commanding view of the valley below is obtained. An intrusive burial, number 39, occurred in the fill of the excavation. Its associated mortuary pottery related it to the later occupants of the village, the pueblo dwellers. Considerable debris of the late period was also present in the room fill. The walls, which bowed slightly outward, showed a liberal and irregular treatment of adobe plaster which terminated near the humus and rubbish layer. In contrast to House D, the floor showed considerable use and was smoothly plastered. There was no evidence of a firepit and the floor revealed no features other than three postholes spaced along the long axis of the room which housed the timbers supporting the roof. In all probability, this house was roofed in a fashion identical to that described for House D. The entryway, which faced north-east was somewhat larger than recorded for House D, but like it, approached the ground level at approximately a twenty degree angle. Like House D, the excavation was fairly shallow, averaging 2 feet 7 inches in depth. The floor area was somewhat smaller than the room just described, measuring 7 feet 7 inches along the northeast-southwest axis, and 7 feet 1 inch along the northwest-southeast axis. The passageway was 2 feet 7 inches wide and 6 feet 4 inches in length. The diameter of the postholes suggests that the timber supports were of about the same size as those employed in House D.

House G. (Plate 10b).

This structure had a number of unique features, although it fitted into the general type of dwelling just described. The house was somewhat larger than either D or E but, like them, was rectangular with rounded corners. The fill of the house showed considerable refuse in the form of sherds, broken metates, 16 manos, fragments of cloud-blower pipes, and rubbing stones. The pit excavation was quite shallow and the bowed-out walls were without plaster. At irregular spacings there were inserted in the walls, from the floor level to a height of 10 inches, stone slabs which probably served as a support to the subsoil which had a tendency to cave into the room. There was no indication that the entire wall had been treated in this fashion, although the large number of stone slabs removed from the fill may possibly have served for this purpose. The floor was very uneven and

showed considerable pitting, possibly the work of rodents. An adobe plaster covered the floor, particularly in the center of the room, but near the walls, only faint traces of it remained. The entryway was located on the east side of the house but, because of its narrow width, it seems impossible that it could have been used as a main entrance. Possibly children used it, but for adults it would have proved a great inconvenience. It may have served as a ventilator, and this belief is substantiated by the presence of a rectangular firepit in the floor. With a fire burning in a pit near the center of the room, the heat rising from it would pass out through a hole in the roof and draw cold air into the house through the ventilator. Other floor features likewise suggest this arrangement.

Six interior posts had been used to support the superstructure which is a different arrangement than that found in other rectangular houses. In the northeast and southwest corners, double support timbers had been employed while but single supports were used in the southeast and northwest corners. If a roof entrance had been used instead of a lateral passage it would have produced a greater strain on the superstructure, necessitating additional interior supports. The pitted condition of the floor in the center of the house indicated that a ladder was connected to the roof opening at this point. All six of the postholes had flat stones in the bottom to serve as a base for the upright timbers. The superstructure conformed to the general style of that described for the circular rooms. Several manos were found on the floor of the room near the firepit.

House G measured 14 feet 8 inches by 11 feet 10 inches at the floor level. The excavation varied in depth from 2 feet 4 inches to 2 feet 7 inches, reaching its maximum along the north wall. The firepit was rectangular in form, measuring 1 foot 9 inches by 1 foot 2 inches, and varying in depth from 4 to 6 inches. It was located 2 feet 9 inches west of the ventilator or entrance (?). At its widest part the passageway or ventilator measured no more than 14 inches, hardly sufficient for an adult to pass through. The postholes indicated that the support timbers were unusually heavy, probably measuring as much as 8 to 10 inches in diameter. The storage hole in the northwest corner of the room averaged 11 inches in diameter and had a depth of 6 inches. The irregular stones at the base of the wall had an average measurement of 18 inches in length, 6 to 7 inches in width, and 3 to 4 inches in height. Eleven such stones were found irregularly spaced at the base of the wall and approximately twenty-five were removed from the upper fill of the room.

House H: (Plate 5a, figure 4).

House H was located west of House G and in close proximity to the pueblo rooms. For this reason, considerable debris and burials from the surface rooms were expected but this proved to be not the case. The lower portion of the room consisted of wind-blown fill and only near the surface were sherds and fragmentary implements common. The latter consisted of several broken manos and one stone effigy in the form of a mountain lion. In contrast to the house just described, there were no large building stones either in the fill or on the floor. The excavation was even shallower than that of House G, and it is to be noted that this shallowness of the subterranean portions of the rectangular pithouses is in strong contrast to the deeper excavations which hold for the circular rooms. The subterranean walls consisted of unplastered native subsoil. Because of the gravel and sand in the subsoil, this produced walls which were irregular and, in places, pitted. A deeper excavation would in all probability have produced a cave-in of the walls. The flaring or bowing-out of the walls seems to have eliminated a portion of the strain. It is quite possible that the plaster of the walls had disintegrated, but the lack of caked adobe or plaster in the fill speaks against it. The floor was covered with a half-inch coating of adobe which, in the center of the room, showed considerable charcoal and ash markings; at the periphery of the room, the floor was uneven. There was no evidence of a firepit in House H and the only additional floor features present were four holes in the corners of the room and two cache holes near the center. Directly in the center of the floor, there was considerable pitting over a rather large rectangular area. The significance of this could not be determined. The same feature was present in House G, and there it was thought to have been caused by the ladder extending down from the roof opening. The house is equipped with a lateral passageway extending out from the northwest wall of the room. It was a sloping entrance and, although not particularly wide, was sufficiently so to allow entrance. An interesting problem is thus raised, and it is not impossible that we have here the development of a ventilator from what originally was a true entryway. The strongest argument against such an assumption is the absence of either firepit or deflector in the floor, and it is not likely that the ventilator would be constructed merely to allow fresh air to pass through the house. It is Roberts'¹⁹ belief, however, that because the ventilator had, at one time, been the actual entrance to the dwelling, there must have been some ceremonial significance attached to it and it was, in all

19. Roberts, 1931.

probability, used at first more for this reason than because of its utility. House H is rectangular in form and has rounded corners. It is somewhat smaller than House G, measuring 11 feet 7 inches by 11 feet. The walls were uniform in height, measuring 1 foot 5 inches from floor level to surface. The postholes varied somewhat in diameter suggesting that the support timbers were not of uniform size. They ranged from 8 inches in



Scale: 1 inch = 4 ft.

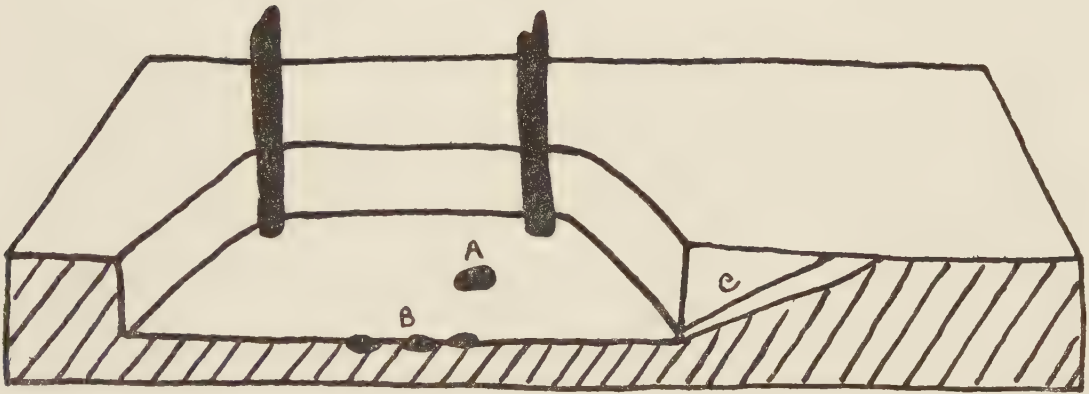


FIGURE 4.

Plan and Section of House H.

A, Floor pit; B, Pitted floor; C, Passage or ventilator?

depth to 1 foot 4 inches, and none was based with stone as in House G. The two cache holes (possibly support holes) were 9 inches and 11 inches in diameter, and 6 inches in depth. The rectangular pitted section in the center of the house was somewhat irregular and measured 3 feet 7 inches by 2 feet 6 inches, and in depth varied from 1 to 3 inches. The presence of the passageway on the northwest side of the room is unique, for in all other rooms equipped with lateral entry, it is located toward the east. This factor likewise suggests that it may be a ventilator. Of course, to a certain degree, all the lateral passageways functioned likewise as ventilators. The passageway measured 2 feet in width and 4 feet in length, and its sloping entrance was at a sharp angle.

House J: (Plate 5a, b).

This room, when excavated, revealed certain features of house construction similar to those noted for the house just described. In erecting this dwelling the builders made the usual rectangular excavation into the subsoil and, as in the majority of the houses, placed the lateral entryway on the east side. The excavation was shallow, indicating that the superstructure was gaining in importance. Whereas the circular structures are characterized by deep pits, the rectangular houses are, in comparison, shallow. In connection with the progression from this house type to surface rooms with true masonry, the findings here are of significance. The subterranean walls were vertical rather than bowed outward as in House H, and were plastered all over with a thin coating of adobe. The floor proved to be uneven and, as in House H, was irregularly pitted near the center. An adobe plaster covered the native soil, which was sandy gravel, and faint traces of charcoal and ashes showed in the plaster. There was no evidence of a firepit nor were cache holes found. There were four holes for timber supports and their irregular spacings in the room are quite different from anything thus far noted. They were situated well in from the rounded corners of the room, and this arrangement resulted in adding surety to the central weight without detracting from the peripheral weight. It is not improbable that the pitting in the center of the room had something to do with a roof opening just as seems to have been the case in the house described above. The placing of additional weight on the roof while gaining entrance may have been the cause for shifting the main supports to the center of the house. The lateral passageway in the east wall was, on the other hand, sufficiently large to allow an adult to enter and was, no doubt, used for this purpose. But it likewise could have functioned primarily as a ventilator when the roof entrance was added.

House J is the largest rectangular room represented at Starkweather Village. At the floor level it measured 15 feet 2 inches along the east-west axis and 13 feet 8 inches at the north-south axis. The depth of the excavation ranged from 1 foot 6 inches at the north wall to 11 inches at the south wall. Posts must have been set around the sides of the excavation to provide for the necessary above-ground portions of the walls. Trenching revealed three such supports but others were probably present and have since disappeared as they projected but a few inches into the top soil. The walls, however, must have been of the sloping type, for the roof materials were not carried by the walls but by the interior supports. Based on the size of the postholes, the interior supports averaged nearly 10 inches in diameter

and were imbedded in the floor to a depth of 1 foot 4 inches. The lateral passageway, which also seems to have functioned as a ventilator, was 3 feet 2 inches wide and 5 feet 8 inches long. The fill of House J showed little debris from the later village occupants although sherds were common near the surface.

House M:

This house presented a number of problems not met with in the houses already described. Upon excavation it was found that the west wall of the room led, by means of a wide passageway, into another room (House L) of almost the same size. The west wall of House M was in such poor condition and the passage to House L so irregular that it was impossible to determine from architectural details whether we were here dealing with a double room or rooms that had been constructed independently at different time periods. The nature of the fill in the houses, floor features, and ceramics, unquestionably of room date, add strength to the belief that the houses were occupied during the same period, that they formed a double room, and had a communal entry chamber extending from the northeast wall of House L. Both rooms were filled with a considerable amount of refuse including sherds, broken manos and metates, small hammerstones, undressed building stones and ashes. The excavation revealed that both rooms were situated on the same floor level but that House L was roughly circular in form, while House M was rectangular. The walls flared outward, were without a plaster coating, and had rounded corners. The floor was extremely irregular and pitted, and much of this seems to have been done by rodents since the abandonment of the house. The arrangement of postholes was such as to suggest that each house had its own superstructure and that the rooms were connected by means of a wide passage in their adjoining walls. House L had seven postholes arranged around the interior periphery of the house, and House M showed a different type of construction in the presence of four support posts in diagonal corners. Midway in this room-to-room passageway was a firepit, rectangular in form, and facing the lateral entry way of House L. The floor also revealed a number of cache pits, two of which contained flint chips and pottery fragments.

House M was rectangular in form as are all the houses of this general class. Measurements at the floor level indicate that the room was 11 feet 4 inches by 10 feet 3 inches. The excavation averaged 1 foot 9 inches in depth. The four support posts which supported the roof and upper walls were, judging from the size of the holes, smaller than in any room so far described. They seem not to have averaged more than 5 or 6 inches in

diameter. This, likewise, is true of the adjoining house, House L, which employed seven support timbers. This room is roughly circular in form, measuring 10 feet 9 inches at the east-west axis and 10 feet 2 inches at the north-south axis. The walls of both rooms contracted at that point where they adjoined although there was a passageway of more than 7 feet wide between the rooms. The rectangular firepit measured 1 foot 9 inches by 2 feet 3 inches and was 5 inches in depth. House L was equipped with a lateral entryway which faced the south-east and this served as both an entrance and as a ventilator for both rooms. The passage was 2 feet 3 inches wide and 5 feet 4 inches long, and was of the sloping type already described. The presence of circular and rectangular pitrooms side by side would seem to mean, in lack of evidence to the contrary, that the house types are probably of the same age. Materials found on the floor tend, in part, to substantiate this statement. Too much reliance should not, however, be placed on the data from this double house, as it is the only example present at Starkweather ruin and, due to the poor condition of the walls and floors, some of the observations may be inaccurate. Furthermore, the data from other circular houses does not correlate any too closely with that of House L. If, as we believe, the round structures are the older, the presence of Houses L and M together would have to be explained in terms of the survival of a house type, and this, of course, is not improbable in the above double house.

House R: (Plates 7b, 19b).

Although House R showed the same general features as the other rectangular structures and has much in common with them, it was from several standpoints a very interesting structure. Its age and relation to the latest dwellings, the surface stone houses, was particularly well illustrated. All of surface stone house No. 10 and parts of rooms Nos. 5 and 6 had been built over pithouse R which was first filled in and made even with the surface level. The excavations disclosed a beautiful example of superposition of room types and the rich refuse in these rooms revealed data of immense aid in reconstructing the sequence of pottery types and minor antiquities. The pit excavation was in an excellent state of preservation, and floor features could be accurately recorded. Although pitroom R is rectangular in form, its rounded corners give it a somewhat ovoid appearance. A trench sunk into the floor of room 10 revealed that the subsoil below the adobe floor consisted of refuse and other materials different from the subsoil in other surface rooms. Likewise the subsoil near the east wall of room 10 proved to be gravel and clay, but only a few inches away this was replaced by the darker refuse fill of the pitroom. The walls

of House R passed under the west wall of stone house 10 and continued several feet to the west into rooms 5 and 6. During the course of removing the fill from House R, burial No. 53 was encountered. This had been a subfloor burial of the stonehouse period and was accompanied with mortuary pottery of classic Upper Gila type.

The pit excavation had been made in such fashion that the walls bowed slightly outward. The walls had been covered with an adobe plaster on several different occasions as evidenced by the south wall which had received five applications. The floor showed a greater evenness than in any of the houses so far described, and this was accomplished by several coatings of adobe plaster. The superstructure had been held up by four main supports situated in the corners of the room. These supported the cross beams upon which poles forming the sloping walls were placed. The entire superstructure seems to have been modeled after that style already described for the circular rooms. A lateral entryway led from the east wall to the ground level. It was of sufficient width to allow adult entrance. Two stone slabs in the passageway suggest that its floor was either stone-lined or that stone steps led to the surface level. Trenches were sunk into the subsoil of all pitrooms in a search for pitroom burials and in House R two subfloor burials were removed. Burial 54, an adult male, was situated near the center of the room at a depth of 2 feet 8 inches below the floor in gravel. The lower extremities were absent and no mortuary furniture accompanied the body. Burial 55, an adult male, was found near the north wall at a depth of 2 feet 6 inches below the floor. With this burial there was mortuary furniture consisting of a partial bowl of Three Circle Red-on-white, one polished black bowl, and a large fragment of Reserve Black-on-white.

Pitroom R was rectangular in form with the walls having rounded corners. The room measured 11 feet 9 inches by 10 feet 5 inches, and the depth of the excavation varied from 1 foot at the south wall to 1 foot 5 inches at the north wall. The shallowness of the excavation is further proof that the superstructures of the rectangular houses were different from those of the circular dwellings and just such occurrences as this led, no doubt, to the discovery that true vertical walls could be built and that the roof could be supported by uprights that did not occupy valuable floor space. The lateral entryway measured 2 feet 6 inches wide and 4 feet 10 inches long and, as has been suggested, may have been a stepped rather than a sloping type.

TYPE IV PITHOUSE: ROUND CEREMONIAL STRUCTURE

Typical House: House B. (Plate 6a, b).

This house, which was situated at the southeast limits of the ruin contained some unusual and puzzling features. Its tremendous size immediately distinguishes it from the remaining pit structures. Likewise the depth of the excavation indicates it was entirely subterranean. In all probability, it was a structure that functioned as a ceremonial chamber and not as a domicile. This, in spite of the fact, that the characteristic associated features of bench, sipapu, firepit, etc., so common in the northern areas are absent. Before excavation the surface of the ground at this point showed a large circular depression, a very common feature in pithouses ruins judging from Hough's²⁰ sketches of pit ruins in the adjacent Luna area. They were frequently termed "reservoirs", and no investigator had taken it upon himself to excavate until Haury did so at Mogollon village and the writer did the same at Starkweather ruin. It has now been definitely established that these large circular structures represent a portion of the complex of an early pitroom culture.

The room was excavated well into the native soil which consisted of both gravel and clay. The circular wall presented a puzzling problem in that the south half of it showed true masonry consisting of large undressed stones horizontally coursed with a liberal amount of adobe, while the north wall showed no such treatment consisting only of unfaced gravel and clay. This need for a stone wall seems to have been brought about by the fact that the room was constructed on a sloping terrain. The slope of the surface at this part of the mesa made the south part of the wall approximately 3 feet lower than the north wall. Doubtless the slope side of the room was built up to a horizontal plane with the north by banking earth against the hillside, and the stone wall was put in to brace the artificial construction. The fill of the south half of the room showed many building stones, suggesting that the coursed masonry wall projected somewhat above its present level. The floor was hard and blackened toward the center but the sides showed little use and were soft and sandy. The irregularity of the floor suggests that there was no prolonged use of the room, and this is just what one would expect if its function was ceremonial. The plane of the floor was also irregular, rising from south to north and uniform as in the other rooms. There was a complete absence of any floor features including firepit and cache pits. The north wall showed what might pos-

²⁰. Hough, 1919.

sibly be a stepped entrance into the room. Very little remained of it and its exact nature could not be determined but it would seem that a stepped terrace of possibly four steps extended from the north wall to a distance of possibly 5 feet into the room. Trenches at the periphery of the wall failed to reveal either a lateral passageway or a bench. As to whether the structure had ever been roofed over could not be ascertained. The absence of any signs of postholes or roof supports in the floor suggests that it was not. Roofing a room of this size would have been a tremendous task, and surely heavy timber supports would have to be used. Their absence in both the floor and the outside periphery of the wall points against any roof construction. Likewise, the fill of the room revealed no evidence of roof materials. Judging from the depth of the wind-blown fill, the room must have been vacant for a considerable period before the construction of the stone houses. Later the Pueblo III peoples used this room, as they did others, for a refuse bin.

House B was the largest excavation in the entire village. The excavation was 37 feet in diameter, somewhat larger than the ceremonial rooms reported by Haury for the Mogollon and Harris village sites. The average depth of the excavation was 5 feet 7 inches and, as has already been indicated, the artificial wall on the south half projected above this. The average size of the stones used in this wall construction measured 1 foot 6 inches in length, 7 inches in width, and 4 inches in height. The step-terrace entrance on the north, if it be such, was 4 feet wide and 5 feet long.

Summary

During the summers of 1935 and 1936 eighteen pit structures were excavated at Starkweather ruin located near Reserve in Catron county, New Mexico. The details of wall and floor features, room form, and placement of upright supports indicate that all rooms conform to the same general architectural pattern. On the other hand within this pattern there are some rather marked variations which, when combined, produce criteria, sufficiently strong, to make possible the classification of the houses into several distinct types. In this classification no temporal or areal relations are here implied. The affiliations and evidences for such can only be determined by means of stratigraphy, dendrochronology and ceramic types. Any correlations of this nature which the Starkweather houses may have is discussed later in this report.

Based upon an analysis of the architectural details, form of house and function, the eighteen pit structures of Starkweather ruin fall into four types:

- Type I. Pithouses circular in form and with lateral entrance.
II. Pithouses circular in form and with roof entrance.
III. Pithouses rectangular in form and with lateral entrance.
IV. Pithouses circular in form, extremely large, and with stepped entrance.

Each house must not be considered as a pure type in itself for there is overlapping of some features even in houses classified into different types. The following combinations of positive and negative features reveal, in brief, the primary differences between the four house types.

Architectural Features	House Types			
	I	II	III	IV
Form: Round	X	X	O	X
Rectangular	O	O	X	O
Entry: Lateral	X	O	X	X
Roof	O	X	O	O
Wall Features:				
Deep pit	X	X	O	X
Shallow pit	X	O	X	O
Bowing walls	X	O	O	O
Vertical walls	X	X	X	X
Wall plaster	O	X	X	O
Floor Features:				
Adobe plaster	X	X	X	?
Fire pit	O	X	X	O
Cache pits	X	X	X	O
Superstructure:				
Flat roof	X	X	X	?
Gabled roof	O	O	X	O
4 corner supports	X	X	X	O
Floor and peripheral	X	O	X	O
Central and auxiliary	O	O	X	O
Room size:				
Large	O	O	O	X
Medium	X	O	X	O
Small	O	X	O	O
Starkweather Pithouses Classified According to House Type	A	K	R	B
	C	N	D	
	F	P	E	
	I		G	
	Q		H	
	O		J	
			L	
			M	

The builders of these pithouses were the first peoples to occupy Starkweather and based upon dated timbers from houses judged to be relatively late the first settlement was made before 900 A.D. The village was

abandoned before the end of the 10th century and somewhat later reoccupied by Pueblo peoples who filled the pithouses with refuse, leveled them off, and over them built surface houses of stone and adobe. In the soft fill of these early houses the Pueblo people often interred their dead.

The interiors of the pithouses were simply furnished. There was an absence of firepits in houses of Type I and Type IV, although present in houses of Types II and III. Outside firepits may have been used although only two were found and it is quite possible that they were made and used by the later Pueblo dwellers.

In several instances burials were found below the pithouse floors and under conditions which point to their being of the same age as the pithouses in which found.

House No. A was of particular significance because of the thick accumulation of refuse above the floor. It allowed for the application of stratigraphical methods in determining the pottery sequence from early to late which in turn served as the primary tool in establishing the sequence of house types.

Although Haury is of the opinion that the Mogollon house pattern is characterized by side entrance I am inclined to believe that the house with roof entrance and ventilator was also common and probably just as wide spread in the Reserve area. The houses which I have classed as Type II had roof entrances but were without ventilators. These small houses have much in common with some of the structures belonging to the end of Basketmaker III period. I would not be at all surprised, too, if some of the Type I and Type III houses which are described as having side entrances are not after all ventilator features. House No. Q (Type I) is equipped with a lateral passageway which is exceedingly narrow and three Type III houses, Nos. D, G, and H, have lateral entrances ranging from 15 inches to 24 inches in width, hardly sufficient to allow adult entrance. Likewise in each of these houses the center of the floor is pitted and troughed, conceivably produced by the ladders extending down from the roof opening. Roof supports are arranged to take care of the additional weight that roof entrance would produce. Those houses which Hough excavated near Luna, New Mexico, probably had ventilators for he refers to the side openings as fire-places with chimney. The problem of the valid classification of the side openings is an important one. If they are classed as passageways it means that we have a wide distribution of this feature throughout the entire Southwest, if classed as ventilators a diffusion of this feature

from the north seems likely for ventilators are a part of the northern house-complex and not a feature found in the province to the south.

Still another example of northern contact in house types is suggested in pithouse No. Q. Although this house possessed most of the features that characterize House Type I, it differed materially in one respect. It possessed an encircling bench at the periphery of the room, a feature not met with in any other house but one which suggests contact with the northern Basketmaker-Pueblo pattern. These similarities with the area to the north take on more significance when we stop to consider the rather peripheral nature of the Pithouse culture with regard to the centers of high development in the Pueblo region and also the great likelihood of a definite time lag.

The nature of material objects and their relative positions in the refuse were of valuable aid in showing the evolutionary sequence of material culture and the foreign influences that were instrumental in shaping the culture pattern. As this is a matter for later discussion it need not be further treated here.

CHAPTER II.

STONE HOUSES OR SURFACE DWELLINGS

Sometimes after the disappearance of the pithouse people the inhabitants of the final stage of culture at Starkweather village came into the region. These people constructed one-story pueblos, of four to thirteen rooms, built on no particular ground plan. On the Starkweather mesa they chose that section of greatest surface regularity and constructed seven rectangular rooms. To this nuclear section they later added four rooms on the west and one on the south producing twelve connecting rooms; connected only in the sense of adjoining and common walls for, in the absence of intra-room doorways, each house was an independent unit. The floors of the rooms were sunk a few inches into the humus layer and walls built up from this point. Into this subterranean base small stones were inserted to make a hard bracing surface. Then from the surface level larger stones were used in erecting the outer and inner walls. Roofs were made of a layer of poles running the width of the room, topped by a layer of brush and finally a thickness of mud and adobe. Below the inside layer of poles was a large flat beam supported by two or three timber supports inserted in the adobe floor. The ends of the poles and the beam protruded through the outer plastered wall. A hatchway in the roof provided entrance to the room. In the larger rooms air shafts pierced the subwalls and opened at ground level. In general all twelve rooms showed the same characteristics of architectural style. They seem however to have varied in their use or function, and this factor serves as the basis for the recognition of three subtypes:

- (a) Domestic with hatch entrance.
- (b) Store room with doorway.
- (c) Ceremonial with hatch entrance.

The stonehouses are situated at the extreme northwest part of Starkweather ruin, and the nuclear walls of the first houses were built over pit-rooms O, P, and R. Several juniper trees were growing over the rooms at the time of excavation which not only produced delay in the daily work but had caused much destruction to the walls and floors.

The twelve rooms in bee-hive arrangement present a rectangular form measuring 36 feet 8 inches along the east-west axis and 59 feet 9 inches at the north-south axis. There is no evidence to support the view that these peoples lived side by side with the pithouse dwellers nor that they made use of any of the buildings of the latter. When the stone house builders came to Starkweather, the early pit dwellers had already moved elsewhere,

and this later culture is not to be thought of as having evolved from that of the earlier occupants. Certain ceramic types do seem however to be derived from the pithouse period. The superposition of the stone house dwellers suggests the chronological sequence of cultures at the village rather than an evolutionary sequence. The population seems never to have been very great for although the amount of refuse around the village is considerable and indicates a fairly long period of occupancy, possibly two centuries, the burial ground to the east of the village and the number of rooms and their size indicate a group of no more than one hundred individuals. The rooms were not excavated in the order given below, but to facilitate description and reference to the map of the ruin the numerical sequence is followed.

DESCRIPTION OF SURFACE ROOMS

Room 1: (Plate 11a, b).

The entire area of the surface rooms formed a rather low and inconspicuous mound consisting of the disintegrated walls of the houses with building stones being scattered both in and outside the rooms, wind blown dirt and refuse. Room 1 formed the northwest wing of the house group and as will be noted later seems to be of later construction; a secondary room added to the original nuclear section. The walls of this room had undergone considerable disintegration, and it is quite possible that the room had been dismantled prior to the final abandonment of the village. The floor of room 1 was built on the surface level, and approximately two feet of the lower walls was intact when the windblown fill and the stones and adobe of the caved-in walls had been removed from the room interior. In the construction of the walls irregular shaped limestone slabs and turtle-back boulders were roughly coursed, that is appearing in horizontal lines. There was a liberal use of adobe and spalls on both the interior and exterior facings. Alternating with the larger stones were horizontal layers of smaller stones in which considerable spalling was evident. The walls were unplastered on both surfaces. The room was without either wall doorway to the outside or intra-room doorway and entrance to the room was through an opening in the roof. If windows were present they could not be determined as only the lower portions of the wall remained. The furniture of the room had been simple, for the only floor features noted were a plastered adobe floor that showed little wear except in the center and two holes which served to house timbers to support the roof. The room was without fireplace and ventilator both of which were found in several of the adjacent rooms. It is not improbable that room 1 served as an an-

teroom or storeroom for the much larger room No. 2 which adjoins it on the north, but the absence of any connecting doorway between these rooms and the complete absence of any evidences such as mealing bins, metates, and manos in room 1 make this explanation seem doubtful. Such furniture might, however, have been removed from the room and the structure not used prior to the abandonment of the remainder of the village. The roof seems to have consisted of cross beams primarily supported by the walls and at right angles to these were placed smaller poles and over this rectangular network was placed branches, brush, grass and finally adobe. Two interior supports were used more to support the weight at the hatch entrance than the normal weight of the roof. Room 1 is rectangular in form measuring 13 feet 7 inches by 7 feet 6 inches. The walls averaged 1 foot 5 inches in thickness.

Room 2: (Plate 11a, b; 12b; 18a, b).

This room is probably the largest single story pueblo unit ever excavated in the Upper Gila region. For this reason and because the room furnishings were elaborate, it was perhaps the most interesting of the surface rooms. About 2 feet 4 inches of the walls remained standing, and the fill of the room revealed the character of the building stones that had gone to form the superstructure. The room was without doorways either to the outside or between rooms. The occupants of the room were thus shut off from their neighbors who were but a wall space away on the north and the east, and they could communicate with one another only by means of the roof entrance. In order to more accurately determine the nature of the masonry and the interior construction of the walls, a portion of the southwest wall was torn down. The height of the wall at this point was 2 feet 2 inches and measured 1 foot 5 inches in thickness. The following observations were made, and they are significant in revealing the masonry technique and wall details.

1. The wall stones were highly irregular in both size and shape. The largest stone used measured 12 inches by 18 inches and weighed approximately 30 pounds. The majority of the stones were about half this size. In addition there were many small pieces that were employed as facing for the interior and exterior.

2. Approximately 60 percent of the facing stones were broken off to produce a smooth face. The remaining 40 percent of the larger building stones were dimpled to produce the same effect.

3. Large stones at the floor level form the base of the wall, and in no instance did the wall extend below floor level.

4. The stones are irregularly coursed and built up by dry stone technic. Both true and false spalls are common. A mud filler had been used particularly between the larger stones, but mud cushioning is absent except for occasional traces at the wall center.

5. The materials used were limestone and sandstone and infrequently conglomerate. The limestone is not of the laminated type and smooth, regular flat slabs are absent.

6. The spalls are almost always triangular in shape.

7. Occasional pottery fragments were used as a binding agent in the mud fill especially in the wall-facing to fill in large spaces between stones.

8. No wall plaster occurs on either the interior or exterior. The east wall of room 2 appears to have been built prior to the north wall which abuts it. There is no interlacing of stones, but through chinking and spalling the walls were partially locked together. The east wall of room 2 which runs the length of the village originally formed the outside wall of the nuclear section of seven rooms and as this wall appears older than the walls abutting it on the north and south, rooms 1, 2, 3, and 4 must necessarily be of later construction. This belief from architectural evidence is substantiated by the ceramic evidence.

Floor features in room 2 consisted of postholes in the four corners of the room, a fireplace near the center of the room, and a ventilator which occupied the lower portion of the west wall and extended by a shallow rectangular pit to the sides of the fireplace. The stones outlining the firepit consisted of flat and well dressed limestone slabs $2\frac{1}{2}$ inches thick, 7 inches high and varying in length from 6 inches to 20 inches. Thin sheets of laminated limestone formed the floor of the firepit. The base of the firepit was sunk about 4 inches into the floor. The pit was roughly square in form, measuring 2 feet 1 inch by 2 feet 2 inches. The ventilator had been cut into the lower wall on the west side of the room, and its sides consisted of two limestone slabs 1 foot 5 inches high, 10 inches wide and 3 inches thick. The ventilator was 10 inches wide and extended 3 inches below the floor level. From this point a rectangular pit of the same width was excavated into the floor to a depth of 3 inches and extended 3 feet 6 inches toward the east where it joined the base of the firepit. There was no evidence of a deflector having been present.

Room 2 was unusual in size. In form it was rectangular and at the north-south axis measured 22 feet 9 inches and along the east-west axis 13 feet 10 inches. The postholes in the floor show that four interior supports were necessary to bear the weight of the roof which owing to its size was

too heavy to be supported by the walls alone. The roof construction was similar to that described for room 1. The postholes were sunk into the floor to a depth of 1 foot 8 inches and judging from their size the timber supports must have averaged about 8 inches in diameter. At the bottom of each posthole was found several quartz crystals. This is analogous to the turquoise beads found at the bottom of the postholes in the great sanctuary of Chetro Ketl, and doubtless represents a religious superstition. Furniture found on the floor of the room consisted of 9 manos, 1 metate, a large corrugated cooking pot, 4 quartz crystals, and innumerable pottery fragments.

Room 3: (Plate 11a, b; 12a, 17a, b).

This room was considerably smaller than room 2 which it joined on the north. None of the 12 surface rooms are identical in size but show a wide range from small to large floor areas. The masonry in this room is similar to that in room 2 but with less use of large stones and more use of mud. Pottery sherds were frequently used in this mud fill. This is particularly true of the facing of the doorway connecting rooms 3 and 4, (Pl. 17a, b). Here large sherds were employed as false spalls between the stones. Many of the sherds were 3 inches by 5 inches in size, and mud cushions separated the stones and the sherds. On the west facing of the doorway which has an area 2 feet 3 inches high and 1 foot 5 inches wide 24 sherds could be seen. The presence of sherds in the walls would seem to furnish excellent data for determining the ceramic age of the room, but an examination of the sherds showed that the builders of this room had picked up many pottery fragments from the surface which had been left behind by the earlier pit dwellers. These were used as false spalls in the wall and as such do not indicate the exact ceramic age of the room.

Room 3 was rectangular in form measuring 13 feet 5 inches by 9 feet 6 inches. Floor features consisted of two postholes, a fireplace in poor condition and placed in the same relative position as in room 2. In the north-east corner several flat stones were embedded in the floor, and a cache hole could be traced down 8 inches into the floor. At the base of the wall opposite the fireplace and directly in front of that feature was a shallow cache containing a miniature black-on-white olla. A doorway in the north wall led to room 4. The doorway was 1 foot 5 inches wide, and its height could not be ascertained as it continued above the height of the wall at this point which was 2 feet 3 inches. The door threshold consisted of two laminated slabs of limestone which were carefully dressed. Furniture on the floor aside from numerous sherds consisted of 1 metate, 4 manos, 3 polishing stones, and one black-on-white miniature olla. Whereas room 2

had four interior roof supports, room 3 because of its smaller size needed only two. They were placed along the long axis of the room, well out from the walls and served to support the extra load at the roof entrance.

Room 4: Length 9 feet 7 inches, (Plate 11a, b; 17a, b).

Width 7 feet 1 inch.

The masonry in room 4 showed general similarities to rooms 2 and 3. As noted above, this room connected with room 3 by means of an intra-wall doorway. The floor contained considerable red clay indicating that the chamber was used for the making or storing of pottery and pottery clay. A flat fire or cooking-board stone was found embedded in one corner. This room which connected with room 3 by means of the doorway was obviously used as a storeroom and workshop as it contained many bone point fragments, pottery clay, manos and the breadboard. The two rooms, numbers 3 and 4, comprise a single unit. The fireplace was absent as a floor feature and one interior support post near the center of the room was sufficient to carry the central load of the roof.

Room 5: Length 12 feet 1 inch, (Plate 11a, b; 13a, b; 14b).

Width 7 feet 2 inches.

The wall construction and masonry details in this room were similar to those of the rooms already described. It was noted that mud fillers and mud cushions were more frequent in the side walls, and this is probably due to the somewhat heavier stones in these walls. In the center of the south wall of room 5 there is a small rectangular opening that leads to room 6. The height of this opening is only 1 foot 9 inches making it almost too small to allow adult entrance. In room 5 the floor in front of this opening had been excavated to a depth of 10 inches to form a rectangular pit. This pit may have served as a storage bin which was easily accessible from room 6. In this room, No. 6, the entire floor level is lower than in room 5 so that the rectangular bin is 4 inches above the floor level at the north wall. The nature of the material found on the floor of room 5 suggests that it served as a storeroom. This material includes fragmentary bone points, a miniature bowl, a badly scarred axe, turquoise beads and pendants, 3 manos and two metates. Below the floor near the east wall the marginal wall of pitroom R was located. This excavation had been filled up prior to the erection of house 5. In the southeast corner of the room was a ventilator shaft constructed of stone in a masonry style comparable to the walls. This shaft measured 2 feet 1 inch by 2 feet 2 inches and was built of stone laid in adobe. The base of the shaft was 2 feet 3 inches below the floor level of room 5, and stone-adobe construction continued vertically above the floor level to the height of the standing wall which at this point was 3 feet 2

inches. The vertical height of the square shaft was then 5 feet 5 inches. How much higher this shaft continued is unknown, but it is not improbable that it continued to the top of the east wall with the upper part of the shaft opening at the roof level. At the base of the shaft, 2 feet 3 inches below the floor of the room, the shaft continued under the south wall of room 5 and into room 6 and continued below the floor of this room to the firepit located near the west wall. This subterranean shaft was 7 feet 10 inches long, 1 foot 10 inches wide and 1 foot 8 inches deep. It is believed that the sub-floor section of the air shaft was covered over with poles, brush and adobe. At the point where the air vent opened in room 6 was a large stone block elevated on an adobe base. As this was located directly behind the fireplace it in all probability functioned as a deflector. In summary then it would seem that the ventilator shaft of room 6 was constructed by means of a subterranean horizontal floor shaft which continued into room 5 and there assumed a vertical position and by employing true masonry technic was carried to the level of the roof. The air currents from the outside were drawn into the shaft and against the deflector of room 6 whipping the fire and forcing the warm and musty air out. Such interwoven architectural features as this between rooms 5 and 6 further substantiate the belief that room 5 was a storeroom for the larger room 6, and the two rooms must be considered as a single house unit. Many sherds were found at the floor level revealing the ceramic age of the room, and these will be discussed later. Two interior support posts were employed to bear the weight of the roof materials. The room was without a fireplace, and there was no wall doorway leading to the outside. Entrance to the room was gained either through room 6, or by a roof entrance. The roof materials were no doubt similar to those already described.

Room 6: Length 19 feet 1 inch, (Plate 11a, b; 13a, 14a, 15a, b).

Width 12 feet 10 inches.

This is one of the largest of the stone houses, being second in size only to room 2. After the excavation of room 6 there was subsequently found below the floor in the northeast part, pitroom N. In many respects this was the most interesting surface room excavated. There were a number of floor features not to be found in the other rooms such as burials, storage bins and mealing bins. The wall construction was similar to that in room 2, but of finer quality. Larger and better dressed stones were employed, and there was less use of mud and smaller stones for chinking and spalling. On an average 4 feet of the walls remained standing.

Floor features of room 6 included a stone lined firepit before which stood a stone and adobe deflector. The construction details of the

ventilator were described in connection with room 5 and need not be repeated here. The deflector was 1 foot in width and 1 foot 5 inches in height. The floor in the center of the room showed considerable wear and frequent application of plaster. Near the south wall were two adobe lined storage bins rectangular in form. They were sunk to a depth of 6 inches below the floor and averaged 3 feet 1 inch by 3 feet 8 inches in size. Four postholes were found in the floor, and these housed the interior support timbers for the roof and superstructure. Secondary features consisted of two subfloor burials; burial 49 was 2 feet 8 inches below the floor and near the southeast corner of the room. Associated furniture consisted of three shell bracelets and a small undecorated olla. Burial 50 was at a depth of 2 feet 3 inches below the base of the south wall. No furniture accompanied it. Many objects were found on the floor indicating that the occupants may have made a hurried exit from the dwelling. These include complete mortuary and culinary vessels, bone awls, 3 metates with bowls at the ends of two, 7 manos, and 3 spindle whorls.

In the north wall there was a doorway of small size connecting this room to room 5. As was previously pointed out room 5 probably functioned as a storeroom for room 6, and so the two rooms must be considered as a part of the same house unit. In the north wall there was also a doorway connecting this room to room 7. Although the opening was quite small it was large enough to serve as a human passage. Below the doorway the floor was soft and consisted primarily of fill. In this fill burial 50, as previously noted, was found. It is quite probable that this excavation was originally made not for burial purposes but to increase the height of the doorway, giving easier passage to room 7. The latter, because of its size and floor features, seems also to have served as a storage room and in all probability rooms 5, 6, and 7 were parts of one house unit. The builders of this house unit had utilized a portion of pitroom N as a storage or granary bin. In the northeast part of room 6 where pitroom N undercuts the north-south wall the floor of this pithouse forms the floor of the storage bin. From this point and along the north-south wall coarsed masonry was carried up until it met the surface wall of room 6. At right angles to this subfloor masonry and extending 2 feet 2 inches into room 6 another sub floor stone wall was built. This produced a rectangular granary bin 7 feet 8 inches in length and 2 feet 2 inches to 3 feet 8 inches in width, and 1 foot 4 inches in depth; the west and south walls being constructed of coarsed stone and the north and east walls consisting of the original unfaced walls of pitroom N. On the floor level of room 6 were two large metates, the ends of these extended at a 15 degree angle over the wall of the storage bin and under the mouth-end of each and

resting on the storage bin floor was a large undecorated storage bowl which caught the ground grain as it fell from the metate. The storage bin floor showed large quantities of sherds of culinary vessels and in the southeast corner two were found intact. All evidences of grains or other materials had long since disappeared. It would seem that the grinding of the grains and other foodstuffs was accomplished in the main room (No. 6) of the house unit and that two smaller connecting rooms, rooms 5 and 7, served as places for the storage of excess amounts. As none of the other 12 rooms in the village show either comparable house units or floor features, it is not improbable that house 6 was used as a center for the grinding of foodstuffs and the storage of the village food supply. Whether the occupants of room 6 had as their specialized task the agricultural pursuits of the village could not be determined. But villages seem to have had their specialized potters which was the work of a select few and such division of labor may likewise have existed in the grinding and storage of grain.

Room 7: Length of room 12 feet 8 inches, (Plate 11a, b).

Width of room 7 feet 6 inches.

For the reasons stated above this room appeared to have been one of the units within house 6, probably serving as a storeroom. The room is built over the west portion of pitroom O which was filled in at the time of construction. The wall masonry was of a type similar to that described for room 2. Other than two metates in the floor and four subfloor holes for interior supports the room was without noteworthy floor features. Frequent coatings of plaster had been applied to the floor which showed considerable tracings of ash and charcoal. Near the center of the room was a circular opening into the floor at the base of which was a flat stone. This opening was 1 foot 6 inches in diameter and 7 inches deep; it may have served as a cache pit. Secondary features consisted of a subfloor burial, burial 51, which at first was thought to be of surface room date, but for reasons already indicated (see room O) it has been impossible to accurately date this interment. Judging from the size of the postholes, located in the corners of the room, the support timbers were small, averaging about 5 or 6 inches in diameter.

Room 8: and Room 9: (Plate 7a, 8b, 10a, 11a, b; 16a, b).

Room 8: Length 12 feet 8 inches.

Width 8 feet 8 inches.

Room 9: Length 22 feet 4 inches.

Width 11 feet 6 inches.

These rooms are described together for the reason that the architectural features indicate that they are units of the same house. Both rooms are

superimposed on earlier pit structures, those designated P and Q which already have been described. When excavated room 8 showed true masonry walls of stone and adobe, 2 feet 8 inches of the walls still remaining intact. The stones showed a regularity in coursing superior to that of any room thus described, but the general method was the same, namely dry stone technic. The amount of mud filler used was considerably less than that for room 2. Floor features in this room were simple in contrast to room 6. They consisted of a fireplace, made of sandstone slabs, located at the center of the room near the south wall. The hearth was approximately 1 foot 8 inches square and was filled with several inches of white ash. The surface of the floor was even and showed a liberal application of plaster, which however was not to be found on either the interior or exterior walls. Four interior support posts were employed, one in each corner of the room. The roof seems to have been of a style already designated for room 2. Entrance to room 8 was by means of a roof entrance as no outside exit in the walls was found. A secondary feature, burial No. 52, was found at a depth of 1 foot 2 inches below the floor, and the associated mortuary pottery defined it as belonging to the surface house phase. Room 8 connected with room 9 by means of a doorway in the north wall. The height of this entranceway could not be ascertained as the upper wall had disintegrated and when uncovered the doorway extended to the uppermost limit of the wall which at this point had a height of 2 feet 8 inches. The entrance was 1 foot 6 inches wide. It seems probable that room 8 may have been without a roof entrance for the fireplace in the center of the room would have interfered considerably with the ladder descending from a central hatchway. If this be true, the only means of obtaining entrance would be through the roof of room 9 and from there through the intra-room doorway. On the floor of room 8 and directly in front of the wall doorway was found a rectangular slab of laminated sandstone which because of its position and size suggests that it was employed as a seal-stone to close the passage, when necessary, between the rooms. With the disintegration of the roof and the upper walls it was forced out of position and fell to the floor. On one face of this slab is the carving of a male figure in which emphasis on sexual features is prominent. Room 9 because of its size and fine masonry, which is almost Chaco in appearance, may have been used for ceremonial purposes and the stone carving may well have been a symbol to designate this. Its apparent use as a seal-stone in the doorway would support this belief. In its general features room 9 was like others that have already been described. Floor features were simple consisting only of an adobe plastered floor and four subfloor openings which housed the interior support timbers for the

roof. Secondary features consisted of three sub-floor burials, numbers 48, 49 and 50 which were found at average depths of 1 foot 7 inches in the fill of pitroom Q. With burial 50 was associated a classic Mimbres bowl of naturalistic design. This is of particular value in correlating the ceramic relations of the Reserve district with those of the Mimbres valley to the south. The masonry of the west and north walls of room 9 was superior to that of any other room in the village. A dry stone technic was employed and both large and small dressed stones were used. There were alternate coursings of varying widths and this plus the evenness of wall facing gave the masonry a strong Chaco appearance.

Room 10: Length 15 feet 8 inches, (Plate 7b).

Width 11 feet 9 inches.

This room is a part of the nuclear section of the pueblo to which later was added rooms 1, 2, 3, 4, and 9. The builders of room 10 had first to fill in pitroom R which was abandoned by earlier occupants of the mesa. Pitroom R undercuts on three sides the stone walls of this room. The room contained considerable wind-blown fill, and a good deal of the superstructure which had disintegrated and fallen inward. The masonry was similar to that described for rooms 2 and 5. The only wall feature present was a ventilator shaft in the east wall, 1 foot 7 inches high and 1 foot 2 inches wide. It was too small to have served as an entryway. Floor features consisted of an adobe-plastered floor and a firehearth directly in front of the air shaft. The fireplace was square measuring 2 feet 4 inches; its sides consisted of limestone blocks 3 inches in thickness and 10 inches high. No deflector was observed. Two metates and three manos were in place on the floor in the northwest corner of the room. At the end of one was a plain bowl buried in the floor, the rim flush with the top of the metate. This association and arrangement is similar to that described for room 6. The floor was without postholes which suggests that no interior supports were needed to support the roof. The weight of the roof was borne by cross beams which carried from wall to wall probably along the east-west axis.

Secondary features included a subfloor burial near the north wall. The burial was that of an adult male and was accompanied with mortuary ceramics of Upper Gila type.

Rooms 11 and 12:

Room 11: Length 19 feet 3 inches.

Width 11 feet 8 inches.

Room 12: Length 11 feet 7 inches.

Width 8 feet 8 inches.

Due to the lateness of the season rooms 11 and 12 were not completely excavated. Trenches were made to outline the walls, and a trench run through the center of the room. This allowed for full observation of the wall features and partial observation of the floor features.

The masonry in these rooms was similar to that described for room 2. Dry stone technic was followed, and liberal use of irregular stone spalls was made. The walls were without doorways leading to the outside or between rooms. Likewise no evidence was found of ventilators. The floor in each room had been carefully plastered and judging from the amount of charcoal and ash had seen considerable use. So far as the trenching revealed, fireplaces were absent. Postholes were found in the corners showing that this room differed from room 10 in that four interior support posts were employed to bear the weight of the roof. The southwest portion of room 11 had been built over the filled in pithouse O, and room 12 had been erected over pitroom P. Room 11 is significant because of its size which is considerably more than that of the average surface rooms found in the Reserve and Luna regions.

Summary:

The peoples whom I have termed Pit-dwellers and who were responsible for the erection of the circular and rectangular pit dwellings in the Reserve region were succeeded at Starkweather by a Pueblo people. This is evident by the superposition of the pueblo or stone houses and the pueblo refuse which is so abundant in the fill of the pitrooms. The pueblo structure occupies the west portion of Starkweather mesa overlooking the Starkweather canyon, and consists of twelve rooms arranged in a solid rectangle measuring 36 feet 8 inches by 59 feet 9 inches. Several of these rooms are built over earlier pitrooms which first had to be filled. The first pueblo builders constructed seven rooms of varying size which were grouped to form a solid rectangle. This section I have designated the nuclear section. To the nuclear section there was later added five rooms, four on the west and one on the north. The rooms vary considerably in size and some are connected, as rooms 5, 6, and 7 by wall passageways so that these rooms form a single house unit. The majority of the rooms functioned as domiciles, but the floor features and materials found in rooms 4, 5, and 7 suggest that they were used only as store rooms. In general all twelve rooms show the same architectural style, but some individual differences are to be noticed. The variation that exists seems not to have been caused by a time element but rather by the fact that different persons constructed the various walls. Some rooms were constructed simultaneously by different builders, and this produced varied types of the same

general style. The walls were constructed of coursed-stone and built up primarily by a dry stone technic. Only rarely was a mud filler used and this occurred always between the larger stones. This mud filler seemed to consist not of adobe, as in the ruins to the north, but of black dirt. The material used forms the humus layer in the region and was probably applied as a mud and allowed to harden. Both true and false stone spalls were employed; in the nuclear section spalling was done with large pottery sherds as well as with stone. Many of the interior facing stones were dressed to produce a smooth surface, and others were dimpled to produce the same effect. The most common wall materials were limestone and sandstone and occasionally turtle-back stones. Wall plaster does not occur on either the interior or exterior of the walls. The floors of the rooms show an application of adobe plaster which in several instances had been repeated as much as five times. An important feature of all upper Gila surface rooms can be found in the corners and edges of the floor at the base of the walls. These portions are usually soft and sandy indicating that the floor received little wear. The floor becomes progressively harder as the center of the room is reached. Summarizing:

1. Entrance to the rooms was by a hatchway in the roof. In none of the rooms was there a wall doorway leading to the outside. Most of the rooms must be thought of as isolated units shut off by solid walls from adjacent rooms. Intra-room doorways were present in rooms 3 and 4, rooms 5, 6, and 7, and rooms 8 and 9. These also functioned in part as ventilators. The finding of a stone slab in front of the doorway in room 8 indicates that the intra-room openings were often closed by a seal-stone.

2. On the whole floor features were simple but considerably more elaborate than in the pitrooms described in the first section. Fire hearths were found in rooms 2, 3, 6, 8, and 10. It will be remembered that rooms 11 and 12 were not completely excavated, and fireplaces may be present which were missed in the trenching. Rooms 4, 5, and 7 were undoubtedly store-rooms and in such fire pits would not be constructed. The generalization can then be drawn that fire hearths are a characteristic and normal feature of the stone house structures which functioned as domestic domiciles in the Reserve district. In general the hearths were of the same type, being square and rectangular in form with the sides consisting of limestone or sandstone slabs. About one-third of the hearth extended below the floor level.

3. True ventilators were present in three of the eight rooms, and thus can be accepted as a common trait of Pueblo III Upper Gila houses. It is

not improbable that the intra-room doorways also functioned secondarily as a source of fresh air currents. Room 6 is unique in having a subfloor shaft which reached the outside by connecting with a vertical shaft in room 5, the vertical shaft extending upward and through the superstructure.

4. Cache pits are not as common in the floors of the stonehouses as they are in the pit structures upon which they are superimposed.

5. All rooms appear to have had flat roofs consisting of cross-beams, poles, brush and adobe. The weight of the roof was borne primarily by the walls, but in some rooms additional interior supports were necessary. These followed no regular pattern of arrangement or number. The larger rooms had as a rule four interior support timbers, and the smaller rooms varied between one and three. Only one room was without interior supports.

6. Metates, manos, and storage bowls formed the standard floor furniture of the rooms. In some rooms, as room 6, the furniture was particularly elaborate and plentiful.

7. Secondary features consisted of subfloor burials and associated mortuary pottery. The burials were at an average depth of 1 foot 3 inches below the floors and in flexed position. Where interment had been made the floor was mended by replastering.

8. All rooms are roughly contemporaneous in time. Five rooms were added to the original rectangular unit, but ceramic and architectural features suggest that this was done soon after the original settlement.

9. The sequence of house types at Starkweather ruin based upon ceramic and architectural criteria was as follows:

1. Circular pit structures.
2. Rectangular pit structures.
3. Surface dwellings of true masonry.

An evolutionary sequence is postulated only for 1 and 2; 3 is not a development from 2 but bears the above chronological relation to it.

CHAPTER III.

DISPOSAL OF THE DEAD AND BURIAL CUSTOMS

With the dwellers of Starkweather village disposal of the dead was a sacred rite. Mortuary practices, however, were not the same throughout all the periods of occupation. The pit-dwellers followed mortuary customs quite different from those of the later peoples.

Pithouse Burial Customs: (Plate 19 a, b.)

Although there were 20 pithouses on the mesa and indications that the population must have been about 100 persons very few burials were found. This rarity can only be explained by there having been an outlying burial ground which has not yet been found, by cremation, or by a brief occupation of the mesa. There was no evidence of cremation found and the ceramic and architectural changes suggest a fairly long period of occupancy. It is quite possible that some burials were made at some distance from the village. Only three burials were found which can be accurately attributed to the pit-dwellers of Starkweather. In addition there are four outlying burials whose culture affiliations are questionable although there are suggestions that they are of pitroom age. Definitely established pitroom burials are:

Burial No. 30. Adult male, found at depth of 2 feet 7 inches below the floor of pitroom C.

54. Adult male, found below the floor of pitroom R.

55. Adult female. Badly decomposed. From below the floor of room R.

With such few burials no sound generalization can be drawn but it appears that subfloor burial was a custom known by the early occupants of Starkweather village. The replastering of the broken floor indicates that the houses continued to be occupied after interments had been made below the floors. The burials showed care in placing the bodies which were extended or closely-flexed on side. There was no uniformity to the placing of arms and hands. The grave pits were either circular or rectangular and only large enough to accommodate the body (plate 19a). The wall of grave No. 30 was plastered with adobe. Mortuary offerings were either absent or extremely simple and in this the pitroom dwellers are a decided contrast to the Pueblo group who placed, profusely, mortuary offerings with the deceased. Burial No. 54 was without mortuary furniture, burial 30 had two pottery bowls, 2 shell bracelets and one arrowhead, and burial 55 had mortuary furniture consisting of three incomplete vessels.

Pueblo Burial Customs: (Plates 20-25.)

The late dwellers of Starkweather interred their dead normally in the

refuse-covered slopes near the dwellings. Thirty-four such burials were found in the refuse north and east of the stone houses and ten burials came from the fill of pitrooms. These rooms had fallen into disuse when the pit-dwellers abandoned the mesa and for the Pueblo people they functioned as convenient dump-pits as well as burial sites. In rare instances subfloor burials were made but the practice seems not to have been widely followed as only eight such burials were met with. This is in sharp contrast to burial customs in the region to the south, the Mimbres, where intramural burials are the normal custom. The conclusion is that outlying burials were characteristic of the Upper Gila pueblo peoples and is based upon the fact that most burials were found either in the refuse slope to the east of the houses or in the fill of the abandoned pithouses. The graves were grouped in a fan-formation in close proximity to the houses. Several smaller ruins excavated in 1934 likewise display a similar burial location. Graves made when the settlement was young and when refuse had not accumulated to any marked degree were sunk into the subsoil to a depth of 6 inches to 2 feet. Also the pithouses which were partially filled with wind-blown debris afforded an ideal location for graves. As the refuse to the east of the houses accumulated, burials were made in it, the earliest resting close to the original ground level and the latest near the present refuse surface. In its present state the refuse had disintegrated to a fine, powdery dirt, filled with sherds, stone fragments and other non-decaying objects.

Position of the Bodies:

The following series of body positions in the grave was determined:

1. Flexed.

- a. On back, hands across chest, knees drawn up and legs folded over body.
- b. On side, hands across chest, knees drawn up and legs folded over body.

2. Semi-flexed.

- a. On back, hands across chest, knees drawn up, feet on ground.
- b. On side, hands across chest, knees drawn up, lower legs and feet on ground.

3. Extended.

- a. Child burials only.

No thought had been given to the orientation of bodies and they were found orientated toward all points of the compass. No burials in the form of cremations were found, and skeletons in reclining and seated positions were absent. The same series of burials was found by the Cosgroves at the Swarts ruin in the Mimbres valley. However in the Mimbres the semi-

flexed position was fully as frequent as the full-flexed, whereas the former is less common in the Reserve district. There were no rock-lined or adobe-lined graves and the grave pits were barely large enough to accommodate the flexed body. The custom of placing the body on the back with knees folded was the prevailing early practice. Later the bodies were placed on their sides and the limbs tightly folded. No time difference could be ascertained between the outlying burials and those which are intramural although the body positions of the latter would affiliate them more closely with the late outlying burials.

The following descriptions of burials is made for the purpose of identification and as a record of individual burials. Sex is indicated by the symbols: M designating male, F, female and ?, not ascertainable. Unless otherwise stated all burials are adults.

<u>Burial</u>	<u>Location</u>	<u>Position</u>	<u>Furniture</u>	<u>Remarks</u>
1-?	Refuse	Flexed	4 bowls 1 pitcher Spatulate-shaped sandstone under head.	
2-?	"	Flexed, on back	Incomplete bowl	No skull, no leg bones.
3-M	"	"	1 bowl 1 pitcher	
4-M	"	"	2 bowls	
5-M	"	Flexed	15 bowls 2 manos 3 bone points	Bowls covered entire body.
6-F	"	"	2 ollas	
7-F	"	"	2 bowls 1 olla	Body rested 8 inches in subsoil.
8-?	"	?	2 bowls	Grave disturbed.
9-?	"	?	1 bowl 1 olla	Infant burial, incomplete.
10-F	"	Flexed	7 bowls 2 ollas	Body rested in subsoil.
11-F	"	"	2 bowls 2 pitchers 2 ollas	Near refuse surface.
12-?	"	?	2 bowls 1 olla	Child.
13-?	"	?	3 bowls 1 olla	Burial of 2 infants or stillborns.
14-F	"	Flexed, on back	4 ollas 2 bowls 1 coiled basket	Mother to No. 13?

15-?	"	"	3 bowls 1 pitcher 2 pendants	In subsoil.
16-?	"	?	1 olla	Child.
17-M	"	Flexed, on back	6 bowls 1 pitcher 1 ladle 1 olla	In subsoil.
18-M	"	Flexed	1 bowl 1 pitcher 1 ladle	In subsoil.
19-M	"	Semi-flexed	17 turquoise beads 1 shell bracelet	
20-F	"	"	2 bowls 1 olla	Near surface.
21-?	"	Flexed, on back	3 bowls 1 pitcher	Bones of child rested on pelvic bones of adult female.
23-F	"	"	Shell and stone beads	In subsoil.
24-?	"	?	1 bowl	Child.
25-?	"	?	None	Child. Grave filled with ashes.
26-M	"	Semi-flexed	2 bowls 1 pitcher 1863 beads	Upper refuse.
27-F	"	Flexed	1 red bead	Burial covered with stones.
28-F	"	Semi-flexed	2 bowls	
29-?	Fill of room C	"	7 bowls 1 olla 2 bracelets 1 pendant	In upper fill.
30-M	Below floor pitroom C	"	2 bowls 2 bracelets 1 arrowhead	Grave circular and lined with adobe.
31-?	Fill of room C	?	5 bowls 1 olla 3 pitchers	Child.
32-M	"	Flexed	2 bowls 2 ollas 1 pitcher	
33-F	"	"	1 bowl 1 olla 1 pitcher 2 bracelets 1288 beads	In upper fill.
34-?	"	?	None	Fragmentary.
35-M	Fill of room D	Semi-flexed	1 olla 1 bowl	Grave disturbed.

36-M	"	Flexed, on back	None	
37-M	Refuse	Flexed	2 bowls	In subsoil.
38-F	"	Semi-flexed	1 bowl 1 pitcher	Surface refuse.
39-?	Fill of room E	Flexed	None	Grave disturbed.
40-M	Fill of room F	"	None	" "
41-F	"	"	2 bowls	
42-F	Refuse	"	2 bowls 1 pitcher	
43-M	"	Semi-flexed	1 bowl	
44-?	"	"	None	Possibly an outlying pitroom burial.
45-?	Fill of pitroom I	Flexed	None	Child.
46-F	Fill of room Q	"	1 bowl	
47-M	"	"	1 bowl	
48-?	"	?	2 bowls 1 olla	Child
49-M	Subfloor, room 6	Semi-flexed	1 olla 3 bracelets	
50-?	"	?	None	Infant. Below door- way in south wall.
51-M	Subfloor room 7	Flexed, on back	None	No leg bones but foot bones lay near pelvis. Possible that leg bones extended above floor and were eventually pulled out.
52-M	Subfloor, room 8	Flexed	1 bowl	
53-M	Subfloor, room 10	Semi-flexed	2 bowls	
54-M	Subfloor, room R	?	None	Body rested 2 feet 8 inches below floor in gravel.
55-F	"	Flexed	Fragments of 3 bowls	Body rested in gravel.

It is to be noted that during the pueblo occupancy of the village intra-mural burial was never exclusively carried out. Only sporadic examples of it are present at Starkweather. The floors of the surface rooms were carefully cleaned and swept to detect any traces of mending where the floor might have been broken for digging a grave and then repaired. Only two such burial pits were found in the twelve surface houses. The interring of burials in the soft black fill of the abandoned pithouses over which

surface rooms had been built and the character of the pottery found with these burials suggests that they were made prior to the erection of the pueblo rooms. It is therefore very doubtful if all the intramural burials described above were intentional.

Mortuary Offerings: (Plates 21-25.)

The most common custom was the practice of placing pottery with the body. This custom appears to be universal with the Pueblos and its precise origin is still a matter of conjecture. In general adults and children shared equally in the number of offerings of pottery but in several cases adult graves were richer than those of children. In only a few instances were graves without pottery. The peoples of the Upper Gila were exceedingly generous in providing the deceased with offerings, particularly pottery. Only rarely was the offering restricted to one vessel. The average for the 52 surface room burials was 3 pottery vessels to each grave. A high percentage of the burials had from 5 to 7 pieces of pottery (pl. 21b, 22a, 23a) and one burial, No. 5, had 15 bowls in addition to other offerings of bone and stone. This practice of multiple burial offerings is distinctive of the Upper Gila area and is in sharp contrast to the Mimbres area where mortuary offerings are normally limited to one bowl usually inverted over the head after being ceremonially killed. Pottery was placed with the body, rather haphazardly except for the head region which was either covered with an inverted bowl or resting in one. In other portions of the grave the bowls are frequently nested, and ollas often display a small capping bowl. Burial No. 5 which was accompanied by 15 bowls had one inverted over the head and the others placed in nests of 3 and 4 between the shoulders and hips. The head bowls are usually black-on-white, although brown ware and polished black are fairly common.

Black-on-white was the dominant burial pottery of the Pueblo peoples of the Reserve district. Other mortuary pottery was polished black, plain, brown and corrugated. Certain trade wares, particularly from the Little Colorado region, were placed with burials indicating that they represented valued possessions. In a few graves at Starkweather a number of tiny, unpainted, moulded bowls were found. They undoubtedly represent a form of plaything, or ornament, as all other Reserve pottery is coiled. It is obvious that the remarkable Tularosa and Reserve black-on-white pottery was never used for domestic purposes. The bowls and ollas show no signs of fire or wear nor do they contain food materials. The making of this ceremonial and burial pottery seems to have been, next to hunting and farming, the Gila's principal activity.

Corrugated ware in graves was not common as it constituted a strictly domestic pottery. Those specimens which were found are of the tooled variety and were probably a purely decorative pottery.

Plain ware was a regular utilitarian pottery, yet we find it a common mortuary offering. Specimens from graves do not, however, show signs of use.

Polished black was used for domestic purposes and as a mortuary offering.

In addition to pottery many other objects were found with the dead. Shell fragments, and stone and clay beads were found with child burials. Occasionally arrowpoints, quartz crystals, lumps of pigment, stone knives, stone scrapers and polishing stones appeared with adult burials. Unusually perfect specimens of manos were buried with the dead (pl. 22a). Three burials illustrating this custom were uncovered at Starkweather, all of surface room age. The manos were brick-like in shape and size, and made either of sandstone or fine volcanic tuff. One basket was found in conjunction with burial No. 14 (pl. 25b). This basket showed the coiled technic of manufacture and its preservation through the long period that had elapsed since Starkweather was occupied was made possible by its being placed in a large olla which in turn was furnished with a capping bowl. The placing of metates with female burials was not a normal custom in the Reserve area although the practice is prevalent in the Mimbres. Only one example was found at Starkweather, a semi-flexed female with a large stone mortar placed directly over the pelvis. The Mimbres custom of "killing" had not been observed. Jewelry offerings were more common with adults than with children. Beads of shell, stone and clay were commonly found around their necks. Pendants of turquoise and shell were often found on either side of the skull. In one case a strand of beads was found around an ankle. Five adult skeletons wore *Glycymeris* shell bracelets, varying in number from 1 to 3. Normally these were found intact on the upper arm. No pipes or warlike implements such as axes, clubs, etc., were ever found with the burials nor were agricultural implements used as offerings.

Among the ancient Pueblos, as the modern, the birth of twins was considered a sacrilege and proof of the gods' anger. One Starkweather burial of a young woman, No. 14, was accompanied by two infants, apparently of recent birth. The natural death of three individuals in this condition is extremely unusual, and it is not impossible that mother and children were put to death for the unfortunate splitting of the egg.

CHAPTER IV.

PHYSICAL TYPE: SURFACE ROOM PHASE

This study deals with a collection of that skeletal material which was obtained from the Starkweather village and six other individual sites within the Reserve district. The majority of the skeletons however are from Starkweather which was thoroughly excavated during the period 1935-1936. Periodic rains over a long stretch of time was responsible for the destruction of a large number of the human remains. Although 118 burials were uncovered in seven different sites only 14 skeletons and 12-odd crania were sufficiently well preserved to be saved. It was possible to determine the age and sex on some 71 skeletons, but only 12 of these were in sufficiently good condition to use for mensuration. Dentition was observed on 27 jaws and one fragment of an upper jaw.

Age and Sex:

The age distribution could only be accurately determined on 93 burials. Of this number 67 were adults and 19 children and 7 infants. It is interesting to compare these results with the Mimbres area, where out of 1009 burials at the Swarts ruin 518 were adults, 158 were children and 333 were infants.²¹ In determining the age of the Starkweather burials the following criteria were employed: closure of sutures, complexity of sutures, eruption of teeth, wear of teeth, loss of teeth and absorption of alveolar processes.

Sex could be ascertained on only 71 of the burials. Of these 47 were male and 24 female. At Swarts ruin, out of 187 adults observed, 107 were males and 80 females. Sex was determined by size of skull, supraorbital ridges, mastoids, zygomatic arches, occipital crest, and shape and character of the pelvis.

It is possible that the above age and sex distribution has no real significance, as the series available for study is so small. However, it must be remembered that these skeletons represent an average of burial types from seven sites, covering an area approximately four miles square and the percentage of error should not be so great in a series taken from so wide an area. Howells, in the Cosgroves' report,²² although observing age and sex on some 187 individuals in the field, places little importance upon his results, because the burials were from a single site.

A high percentage of the Upper Gila burials were 35 to 40 years old, and this age is found to be typical in most portions of the Southwest. It is only six or seven years lower than the general average for Pueblo burials. The mortality in the Reserve area must have been about the same as that of

21. Cosgrove, 1932.

22. Cosgrove, 1932.

other areas. Life was not however the severe struggle it was in the desert pueblos.

Stature:

To compute the average stature of this group of skeletons a formula devised by Wilder²³ was used. The femurs and tibiae of some 47 skeletons were measured, the measurements obtained compared with a table of coefficients, the stature arrived at by a simple calculation, and the total averaged. Hooton²⁴ used a different method on his study of the Pecos series as did Howells in his computation of the Swarts material, yet the results are not greatly different.

		STATURE (mms)		Total Average
		Range	Average	
Males:	Upper Gila (Reserve)	1656-1589	1626.1	1551.15
	Pecos		1617.4	
	Mimbres		1621.5	
Females:	Upper Gila	1538-1282	1476.2	
	Pecos		1501.1	
	Mimbres		1546.2	

The heights for the female series is slightly below the average of any present day Rio Grande pueblo people, and generally low for Southwestern and Mexican Indians. The low figure for the Gilas may be due, however, to the small number of cases. In general the stature seems to be quite uniform from Pecos to Swarts.

Cranial Measurements

All of the Starkweather skulls from late surface rooms showed occipital deformation. The deformed skulls of Pecos have been analyzed at great length by Hooton,²⁵ and he has presented several types and degrees of deformation as well as a detailed analysis of the significance and origin of the custom among the Pueblo Indians. It is not necessary to reproduce that discussion here. Quoting from Hooton, "all crania with a very slight occipital deformation are regarded as undeformed, as it seems improbable that the cranial index has been much altered by the slight amount of deformation suffered." There were no skulls in the Gila series that could be considered as belonging to this classification. All of the Starkweather series showed marked deformation, with slightly more on the left side of the occipital region than the right.

It is significant that only one skull in the Swarts series could be

23. Wilder, 1920.

24. Hooton, 1930.

25. Hooton, 1930.

classified as undeformed. This makes the curve proportionate throughout to the large Pecos series, which has 6.5% undeformed. The single specimen from the Mimbres constitutes 5% of the total. With the unusually small Gila series, the non-occurrence of an undeformed group is perfectly likely.

Dr. Harry Shapiro²⁶ has devised a statistical formula for deriving the hypothetical undeformed average for the diameters of a series of deformed skulls, by correlating each of the three measurements with some cranial measurement or index which is not affected by deformation. Such a correction was not attempted on the Gila skulls, as no undeformed skulls were present from which to obtain figures for the calculation of a constant. Although a method does exist whereby the constant can be found in a completely deformed series, it is highly inaccurate and would be useless in such a survey as this represents.

Were corrections made, the cranial index (87.5) would not change greatly, remaining brachycephalic. This is also the case with Mimbres crania. On the other hand the Pecos skulls proved mesocephalic after correction. Dr. Hooton claims that normally round heads are, by their very shape, more susceptible to deformation than dolichocephalic crania. This may explain the remarkable concentration of deformation in the Mimbres and Gila series. They are brachycephalic in addition to being deformed.

MAXIMUM BREADTH

		Number	Range
Males:	Upper Gila, Def.	7	150 - 131
	Pecos, Def.	91	159 - 132
	Mimbres, Def.	9	148 - 135
Females:	Upper Gila, Def.	5	143 - 142
	Pecos, Def.	68	154 - 121
	Mimbres, Def.	5	141 - 129

GLABELLO—OCCIPITAL LENGTH

		Number	Range
Males:	Upper Gila, Def.	7	172.7 - 159
	Pecos, Def.	95	187 - 140
	Mimbres, Def.	10	175 - 139
Females:	Upper Gila, Def.	5	156 - 140
	Pecos, Def.	71	179 - 144
	Mimbres, Def.	5	162 - 151

26. Shapiro, 1928.

CEPHALIC INDEX

		Number	Range	Total Average
Males:	Upper Gila, Def.	7	88.2 - 77.3	87.5
	Pecos, Def.	91	102. - 73.	
	Mimbres, Def.	9	95. - 77.	
Females:	Upper Gila, Def.	5	98.2 - 91.6	
	Pecos, Def.	68	104. - 68.	
	Mimbres, Def.	5	93. - 80.	

Though necessarily distorted by deformation, the cranial index is strongly brachycephalic. Among the males it ranges from mesocephaly to brachycephaly, but the females show a remarkable high condition of brachycephalism throughout. The low range of the males is fairly consistent in Gila, Pecos and Mimbres, but the females vary.

BASION-BREGMA HEIGHT

		Number	Range
Males:	Upper Gila, Def.	7	147 - 138
	Pecos, Def.	80	156 - 129
	Mimbres, Def.	6	151 - 137
Females:	Upper Gila, Def.	5	143 - 137
	Pecos, Def.	55	148 - 127
	Mimbres, Def.	5	137 - 133

LENGTH-HEIGHT INDEX

		Number	Range	Total Average
Males:	Upper Gila, Def.	7	87.4 - 81.4	87.4
	Pecos, Def.	80	101. - 72.	
	Mimbres, Def.	6	90. - 85.	
Females:	Upper Gila, Def.	5	96.5 - 87.8	
	Pecos, Def.	55	95. - 75.	
	Mimbres, Def.	5	90. - 83.	

Although the basion-bregma height would be considerably reduced by correction, the hypsicranial condition of these crania would remain. The Mimbres series shows this same strong trend, while the Pecos series are orthocranial. The short range of both males and females is due to the small series, and this naturally boosts the average.

STARKWEATHER RUIN

BASION-NASION LENGTH

		Number	Range
Males:	Upper Gila, Def.	7	105 - 101
	Pecos, Def.	67	109 - 92
	Mimbres, Def.	8	103 - 91
Females:	Upper Gila, Def.	5	114 - 93
	Pecos, Def.	40	108 - 89
	Mimbres, Def.	5	100 - 92

BASION-ALVEOLAR LENGTH

		Number	Range
Males:	Upper Gila, Def.	7	106.9 - 95
	Pecos, Def.	65	105. - 94
	Mimbres, Def.	6	105. - 94
Females:	Upper Gila, Def.	5	109. - 87
	Pecos, Def.	40	107. - 85
	Mimbres, Def.	4	100. - 95

GNATHIC INDEX

		Number	Range	Total Average
Males:	Upper Gila, Def.	7	100 - 95.1	96.8
	Pecos, Def.	65	103 - 90	
	Mimbres, Def.	6	115 - 98	
Females:	Upper Gila, Def.	5	99 - 93.5	
	Pecos, Def.	39	105 - 91	
	Mimbres, Def.	4	103 - 99	

A lack of prognathism was observable on every skull, and the index is unusually low, being distinctly orthognathous. Mimbres crania were prognathous throughout, while Pecos skulls, though varying considerably, displayed a condition similar to the Gila group.

MAXIMUM BIZYGOMATIC DIAMETER

		Number	Range
Males:	Upper Gila	6	145 - 129
	Pecos	102	161 - 122
	Mimbres	4	137 - 129
Females:	Upper Gila	4	125.7 - 121
	Pecos	68	138 - 118
	Mimbres	2	129 - 127

NASION—GNATHION HEIGHT

		Number	Range
Males:	Upper Gila	6	120.5 - 97
	Pecos	107	135. - 107
	Mimbres	7	124. - 112
Females:	Upper Gila	4	142. - 102
	Pecos	71	125. - 100
	Mimbres	1	

TOTAL FACIAL INDEX

		Number	Range	Total Average
Males:	Upper Gila	6	83.1 - 74.8	82.2
	Pecos	86	99. - 70.	
	Mimbres	4	87. - 84.	
Females:	Upper Gila	4	89.1 - 82.2	82.2
	Pecos	59	96. - 76.	
	Mimbres	1		

Facial measurements are medium, slightly smaller than those of the Mimbres and Pecos series. The index is high mesoprosopic, in contrast to the Mimbres low mesoprosopic.

NASAL HEIGHT

		Number	Range
Males:	Upper Gila	6	60. - 42.5
	Pecos	125	57. - 45.
	Mimbres	12	54. - 47.
Females:	Upper Gila	5	49.5 - 47.6
	Pecos	86	53. - 45.
	Mimbres	5	50. - 43.

NASAL BREADTH

		Number	Range
Males:	Upper Gila	6	26.3 - 25.
	Pecos	126	30. - 21.
	Mimbres	13	30. - 25.
Females:	Upper Gila	5	25.1 - 23.
	Pecos	86	30. - 21.
	Mimbres	4	26. - 24.

		NASAL INDEX		Total Average
		Number	Range	
Males:	Upper Gila	6	62. - 42.5	50.7
	Pecos	124	65. - 40.	
	Mimbres	12	57. - 47.	
Females:	Upper Gila	5	50.5 - 48.3	
	Pecos	86	62. - 42.	
	Mimbres	4	58. - 51.	

The nasal aperture is fairly broad, but less so than the Mimbres noses and also slightly less than the Pecos. As an average, the Gila noses show a greater height than the Mimbres, and about the same height as the Pecos. The index is high mesorrhine, bordering on platyrrhiny and in this respect is like the Pecos series. The Mimbres nose differs in that it is platyrrhine. It is unfortunate that the Upper Gila and Mimbres series is not larger.

		ORBITAL BREADTH *	
		Number	Range
Males:	Upper Gila	6	40.5 - 37.
	Pecos	117	49. - 35.
	Mimbres	13	43. - 37.
Females:	Upper Gila	5	38.2 - 33.6
	Pecos	77	42. - 34.
	Mimbres	4	41. - 37.

		ORBITAL HEIGHT *	
		Number	Range
Males:	Upper Gila	6	40. - 37.
	Pecos	117	38. - 30.
	Mimbres	13	41. - 32.
Females:	Upper Gila	5	38.7 - 35.6
	Pecos	78	41. - 29.
	Mimbres	3	35. - 32.

		ORBITAL INDEX		Total Average
		Number	Range	
Males:	Upper Gila	6	107.7 - 84.8	98.02
	Pecos	120	99. - 78.	
	Mimbres	12	92. - 80.	

* Measurements were taken on the left eye only.

Females:	Upper Gila	5	105.9 - 89.1
	Pecos	83	98. - 76.
	Mimbres	4	94. - 85.

In general the Gila orbits are narrower and lower than the Mimbres series, and approximately the same as the Pecos. The index is strongly megaseme, while the Mimbres shows high mesoseme.

Cranial Observations

Sutures:

The male crania, on the average, show a more involved serration than the female. Oddly enough, however, the skull with the most complicated occipital suture was a female. Some 43 Wormian bones were noted. Comparison with the Mimbres²⁷ and Pecos crania show that the degree of serration is similar to the former, with fewer simple, and more complicated sutures. Regarding the order of suture occlusion, little can be said with any degree of accuracy, as the series is so small. In many cases the sutures have been obliterated by extreme age. In other crania, the closing is consistently similar to the Mimbres group; beginning in the coronal or both coronal and sagittal sutures. Howells²⁸ reached the conclusion that the order was coronal, sagittal and lambdoidal for the Mimbres and the Gila series seems to parallel this. For the Pecos material Hooton²⁹ concluded that the order was sagittal, coronal and lambdoidal.

Wormian bones occur less frequently than at Swarts or Pecos in the males; more frequently than at Swarts and less than Pecos for the females.

PERCENTAGE OF WORMIAN BONES

		No. Present	No. Absent	Percent
Males:	Upper Gila	6	10	37.5
	Pecos	115	25	82.1
	Mimbres	8	5	88.89
Females:	Upper Gila	4	6	66.6
	Pecos	84	25	77.06
	Mimbres	3	2	60.

Ascending Ramus:

The Gila ramus is slightly higher than the Mimbres, and lower than the Pecos. A marked sex difference can be noticed in all three series. The

27. Cosgrove, 1932.

28. Howells in Cosgrove, 1932.

29. Hooton, 1930.

female heights are lower throughout. Although no comparative figures were available for the maximum breadth of the ramus, the measurements on the Upper Gila series display a sex difference here also.

HEIGHT OF ASCENDING RAMUS

		Number	Range	Total Average
Males:	Upper Gila	11	49-70	58.25
	Pecos	116	48-78	
	Mimbres	13	54-71	
Females:	Upper Gila	7	51-63	
	Pecos	79	46-65	
	Mimbres	5	52-56	

MAXIMUM BREADTH OF RAMUS

		Number	Range	Total Average
Males:	Upper Gila	11	53-39	46.8
Females:	Upper Gila	7	50-41	

Cranial Capacity:

Howells³⁰ expressed doubt as to the accuracy and validity of his results when he discovered the cranial capacity of the Mimbres series to be so low. It is significant that the Gila series from Starkweather display an even lower cranial capacity for the males than the Mimbres. The total average for the Gila was found to be 1229.5 cc which is about 100 cc lower than the average capacities for American Indians, and little higher than those for Australians. It would appear from the female results that the Mimbres capacity was merely a low extreme, and not a typical figure.

CRANIAL CAPACITY

		Number	Range	Average
Males:	Upper Gila, Def.	6	1350-1150	1218.7
	Pecos, Def.	68	1560-1110	1367.9
	Mimbres, Def.	3	1280-1190	1249.3
Females:	Upper Gila	4	1313-1175	1244.3
	Pecos	54	1480-1050	1254.
	Mimbres	1	1170	1170.

30. Howells in Cosgrove, 1932.

Frontal Region:

The Upper Gila crania show a distinct tendency toward narrowness and lowness of the forehead. In this respect they are like the Mimbres studied by Howells. Receding foreheads are more common among females than males in the Pecos series, but in the Gila the males show this condition to a greater degree. Similar are the Mimbres crania.

The Gila supraorbital ridges, like those of the Mimbres, display more prominent development on the male crania than do those of Pecos. The females are distributed normally. The male ridges consist of a V at the glabella, with a continued thickening bulge over the upper external corner of the orbit. On the females the ridge is a slight linear swelling extending from the middle of the upper edge of each orbit into and across the glabella.

Sagittal Region:

The conditions which Howells observed on the Mimbres crania seem also to prevail in the Upper Gila series. These are: an absence of male crania which are narrow in the sagittal region due to deformation; a number of female specimens displaying narrowness, due to a smaller amount of deformation; considerable elevation along the suture; and an average distribution in the prominence of the bosses of the parietal bones.

Temporal Region:

Deformation has caused a false fullness of the temporal region on the Gila skulls. This condition also is true of the Mimbres crania from Swarts ruin. This is not so apparent on the Pecos specimens, as they are not so consistently and strongly deformed. Sexual differences are non-existent in either the Mimbres or Gila series. In the observation of supermastoid crests the males, however, show a greater development of this feature in the Gila, Mimbres, and Pecos series.

A normal distribution of size can be observed in the mastoid processes in both the Gila and the Mimbres, the medium size tending to predominate in both sexes. On Mimbres crania, Howells³¹ found the males (aside from the mode) to be large and the females small. In the Gila series the males were medium and the females small. Both sexes in the Gila and Mimbres, however, showed larger processes on the average than the Pecos. Both Mimbres and Gila show a pronounced definition of the temporal crest.

Alveolar Prognathism:

This was more predominant on the Gila females than the males. However, out of a total of 12 observable crania, only two females and one male displayed the characteristic. This may be compared to Howells finding on

31. Howells in Cosgrove, 1932.

Mimbres crania where from a total of 17 skulls, all displayed alveolar prognathism in some degree. Both sexes from the Mimbres reveal a somewhat smaller amount than Pecos crania, yet the gnathic index showed the former to be definitely more prognathous. The Gila specimens are thus considerably more harmonious than the Mimbres; their condition of orthognathy corresponding to the lack of alveolar prognathism.

Teeth:

SHOVEL-SHAPED INCISORS

	Male	Female
Present	6 out of 18	6 out of 8
Degree: Medium	4	2
Marked	2	4
Very small lower incisors	5	2

THIRD MOLAR ABNORMALITIES

	Male	Female
No space in jaws	2	1
Impacted	3	1
Imbedded	1	3
Perfect condition	4	2
Lost in life	5	4

WEAR OF TEETH (YEARS)

Slight	Medium	Much	Extreme
25	35	35	60
30	35	40	60
30	30	40	50
35	40	40	80 (?)
35	40	50	
	40	50	
		60	

Shovel incisors were first investigated and described by Hrdlicka,³² who recognized their value in determining morphological types. On the lingual surface of this type of incisor (median or lateral) appear ridges of enamel on the lateral edges, and sometimes on the distal, producing a triangular fossa on the central portion of the surface. These ridges converge towards the base of the tooth. In the hollow formed by the converging

32. Hrdlicka, 1920.

ridges there is often a fissure in the enamel, although Hrdlicka has never noted decay at this point, nor is any to be found in the Gila teeth. Associated with the shovel development there may also be a vertical groove on the lingual surface. Although this condition is primarily confined to the upper incisors in the Mimbres and Pecos series, it occurs on both upper and lower in every case in the Gila specimens.

Shovel incisors are not a degenerate characteristic; on the contrary they are generally large strong teeth. Shovel-shaped incisors are found in a high percentage of Indians, Chinese, Japanese and Hawaiians, or peoples of Mongoloid extraction, and in a very low percentage of Whites and Negroes. For Indians in general, Hrdlicka gives these figures:

Medium degree	67%
Submedium degree	24%
Total	91%

A condition exists in the Gila jaws which was either not present or not observed by Hooton³³ and Howells³⁴ in the Pecos and Mimbres series. The presence of very small lower incisors was fairly common, and this occurred only on teeth that were shovel-shaped. Although no definite significance can be made of this as yet, the condition may establish a correlation between the growth of the tooth and the "exuberance" of the enamel-forming capacity of the individual. Further investigation might reveal that the surplus presence of the enamel inhibits the normal growth of the tooth, a kind of compensating factor.

The table of third molar abnormalities and conditions of normality is self-explanatory, in the main. Howells and Hooton observed no cases where the actual space in the jawbone for the third molar was lacking, while the Gila series showed two, one male and one female. In general this condition is rather rare in American Indian dentition. Rotation and impaction was much commoner in the Pecos and Mimbres than in the Gila. Only one case could be found in which the third molars were not in the jaw at all, although plenty of space had been allowed by nature for their entry. It was not found in the Mimbres and Pecos groups.

Summary and Conclusions

This study of the cranial characteristics can now be summarized as follows:

1. The Gila skulls are all deformed, and to a degree approximating the Howells classification of "Pronounced".

33. Hooton, 1930.

34. Howells in Cosgrove, 1932.

2. The Gila skulls are brachycephalic, and would be even if corrected for deformation.
3. The skulls are hypsicranial, and would be even if corrected for deformation.
4. The skulls are orthognathous.
5. Facial measurements are medium, and slightly below the Indian averages in dimensions which are high for the world. The index is high mesoprosopic.
6. The forehead is fairly narrow and receding. Supraorbital ridges are prominent.
7. The nose is high mesorrhine, bordering on low platyrrhine. It is of average Indian height, but a little broad for the North American average.
8. The orbits are high megaseme, being rather narrow and low for Indians.
9. The Gila skull has an average capacity of 1229.5 cc, a figure about 100 cc. lower than the American Indian average.

The series studied in this report is so small that refined analysis is almost futile, expressing inaccurate results as it would. I can only do what Howells attempted with his Swarts crania; assign them a tentative position in the plotting of racial types.

The average index will be given, then the group of people whose index most closely approximates the Gila figure. The numbers were obtained from Howells tables, who in turn secured them from various sources.³⁵

CRANIAL INDEX: (Deformed)	Upper Gila	88.93
	Mimbres	87.4
	Mongol	81.4
Maximum Breadth	Upper Gila	141.5
	North Pacific	140.8
	Arikara	142.5
Glabella-occipital Length	Upper Gila	159.6
	Mimbres	160.6
LENGTH-HEIGHT INDEX	Upper Gila	87.4
	Mimbres	86.4
TOTAL FACIAL INDEX	Upper Gila	82.2

35. Quatrefages & Hamy: *Crania Ethnica*. 1882.

Hrdlicka, A.: *Catalogue of Human Crania*. 1920.

Hooton, E.: *The Ancient Inhabitants of the Canary Islands*. 1925.

Knight, M. V.: *The Craniometry of Southern New England Indians*. 1915.

Oettinger, B.: *Craniology of the North Pacific Coast*. 1930.

Hooton, E.: *Indian Village Site and Cemetery near Madisonville, Ohio*. 1920.

	Madisonville	83.
	Southern New England	84.
Bizygomatic Diameter	Upper Gila	130.17
	Tenerife	132.
	Southern New England	132.
Nasion-gnathion Height	Upper Gila	115.37
	S. Australia	114.5
	Mimbres	116.43
NASAL INDEX	Upper Gila	50.68
	Annamese	50.98
	Pecos	50.44
	Mimbres	50.42
	Mongol	48.6
Nasal Length	Upper Gila	49.77
	Mimbres	49.67
	Peru	50.
	Mandingo	50.
Nasal Breadth	Upper Gila	24.7
	Tenerife	24.
	Peru	24.
	North Pacific	24.7
CRANIAL CAPACITY	Upper Gila	1229.5 cc
	S. Australia	1285
	Mimbres	1300

A study of these comparisons reveal that the Upper Gila physical type is most similar to the Mimbres, and both show unusually low measurements.

Hooton, in his study of the Pecos series, determined that the skulls fell into 8 groups, to which he gave arbitrary names based principally on facial characteristics.* He then proved the validity of accepting these types as the results of the partial segregation of various strains contributing to the population, by statistically comparing each type to the group as a whole, and with different series from all over the world. This was not intended to show a close relationship with any people outside America, but it does show that the Pecos type melts away into a number of "cranial patterns", or complexes of features, continually blending and resegregating.

* Hooton's eight types: Basket-makers, Pseudo-Negroids, Pseudo-Australoids, Plains Indians, Long-faced Europeans, Pseudo-Alpines, Large Hybrids, and Residuals.
Total Series A is the original Pecos series.
Total Series B is the whole group of eight types.

Only the hybrid types, the Residual and the Large, fail to show significant variation from the whole group, and this applies to the Larger hybrids only in the case of indices. A lack of sufficient specimens and extensive measurements prevented a similar study in the Gila series.

A general statement may be made: The Mimbres and Gila measurements show a general affinity to many types, but the Pseudo-Negroids and Residuals seem to be closest. The Mimbres means are very slightly lower than the Total Series A of Hooton, which includes the two types above, so the impression of a true affinity to these Pseudo - Negroids and Residuals is false.

The indices of the Gila and Mimbres groups show a closer relationship to the Total Series A than with any sub-group. Thus there has been linked the Mimbres and the Northern Rio Grande areas, showing that the physical type is uniform from Pecos to Swarts.

CHAPTER V.

PHYSICAL TYPE — PITHOUSE PHASE

Due to the rarity of skeletal material from the Pitroom phase of Starkweather Village no accurate generalizations can be drawn from a study of the physical type. Only three burials of pitroom age were found and of these but two were sufficiently well preserved to use for mensuration. On the third a few observations were possible. The data are presented here only for the purpose of comparing the physical type with that reported by Woodbury for the Mogollon skeleton. As Haury³⁶ considers skeletal evidence as his strongest argument for Mogollon culture distinction and inclusion in an Eastern group, the Starkweather burials which also are of Mogollon age have a direct bearing on this problem.

Age and Sex:

SKELETON	AGE	SEX
Starkweather No. 30	35-40	Male
Starkweather No. 55	50	Male
Starkweather No. 54	Adult	?

On a series so small the age and sex distribution has no significance, and it is included here only for the reason that it bears on the measurements which follow.

CRANIAL MEASUREMENTS

	Male No. 30	Male No. 55	Average
Deformation	Moderate occipital	None	
Maximum length	168.0	171.0	169.5
Maximum breadth	133.	134.	133.5
Basion-bregma	132.		132.
Menton-nasion	114.	119.	116.5
Bizygomatic max	128.	137.	132.5
Alveolar-nasion	67.	68.	67.5
Orbital height	34.	39.	36.5
Orbital breadth	39.	41.	40.
Nose height	48.	49.	48.5
Nose breadth	27.	26.	26.5
Preauricular-bregma	118.	115.	116.5

Indices:

Cranial index	79.1	78.3	78.7
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36. Haury, 1936.

Orbital index	87.1	95.1	91.1
Nasal index	56.2	53.	54.6
Total face index	89.	86.1	87.5
Upper face index	52.3	49.6	50.9

In general appearances, the skeletons are of persons of slight physique conforming closely to the general character of modern Pueblo peoples. Both skeletons are males above middle age. Both skulls are definitely mesocephalic. The moderate degree of deformation of the occipital on No. 30 seems not to have altered to any extent the head measurements, although if corrected the index would be even more strongly mesocephalic. The cranial vault is of average height and somewhat higher than that recorded by Woodbury for the Mogollon female skull. It is not improbable that this difference is correlated with sex. The most conspicuous feature of the face on these two crania is the wide range in facial length and facial width. Male No. 30 has an extremely narrow face (128) in contrast to the broad face (137) of Male No. 55. The face of male No. 30 is unusually long (114) for its width. The female skeleton from Mogollon Village exhibits a similar feature. There is a striking difference in the orbits of the two skulls; Male No. 55 has orbits which are round in contour, and the index is strongly megaseme; the orbital index of Male No. 30 is considerably lower and definitely mesoseme. On both skulls the nasal aperture is low and wide with well defined gutters on No. 30; Male No. 30 is strongly platyrrhine as is Male No. 55, although the condition is less pronounced. Both skulls have broad palates and full sets of teeth which, although in good alignment, are considerably worn, possibly because of a gritty diet. There is nothing primitive in the general appearance of either skull, and they seem definitely Indian.

Comparative Measurements:

The Starkweather series (two skulls) has been compared to a Caddoan series (Wichita, Pawnee), to Haury's Mogollon Village Skull, and to the Starkweather Surface Room series in an effort to determine racial affiliation. Obviously because of the smallness of the comparative series the accuracy of the evidence must be taken at face value. We have seen that the cranial measurements of the Starkweather skulls are not in close accord, rather the mensurations suggest two individual types. For this reason the individual measurements rather than the average have been included in the comparative tables. The Caddoan series was selected only because Woodbury³⁷ found that the Mogollon Village skull was nearest to a female

37. Woodbury in Haury, 1936.

series of that group. Hrdlicka³⁸ gave no male series for the Caddo proper,¹ and the Pawnee have been substituted in their place. I am, then, comparing the male crania from Starkweather with a Wichita-Pawnee male series.

Comparative measurements of Mogollon Skulls Nos. 30 and 55.

	Surface Room	Starkweather		Pawnee	Wichita	Mogollon Village
		No. 30	No. 55			
Number	7	1	1	3	3 1 (Female)	
Deformation	Marked	Slight	None	None	Very slight	Slight
Max. Length	162.4	168.	171.	180.	176.	161.
Max. Breadth	141.5	133.	134.	146.7	148.	145.
Basion-bregma	137.	132.		127.	134.3	123.
Menton-nasion	117.	114.	119.	123.		112.
Bizygomatic	136.	128.	137.	142.	140.	132.
Alveolar-nasion	68.	67.	68.	73.	77.*	68.
Orbital Height	37.5	34.	39.	37.7	36.3	36.
Orbital Breadth	39.	39.	41.	39.8	40.7	37.
Nose Height	53.	48.	49.	53.7	54.5	49.
Nose Breadth	26.3	27.	26.	27.	26.3	28.
Indices:						
Cranial	86.4	79.1	78.3	81.5	83.2	90.06
Orbital	96.1	87.1	95.1	94.6	89.3	97.3
Nasal	49.6	56.2	53.	50.3	48.3	57.1
Total Face	86.	89.	86.1	84.7		84.85
Upper Face	50.	52.3	49.6	51.4	55.4*	51.5

Woodbury's comparative studies showed him that the Mogollon type was nearest a female series of Caddo and Wichita types, extracted from Hrdlicka's Catalogue of Human Crania.³⁹

"Points of close similarity between the Mogollon and the Caddoan are apparent in the mutual brachycephaly combined with a low skull vault. The facial diameters are also similar. . .

"This leads us to conclude for the moment until we have more data for comparison that the Mogollon specimen . . . is probably allied to the Caddoan type as shown by a comparison of the crania of these two series. That is to say that both, Mogollon and Caddoan, are brachycephalic and low vaulted with similar facial proportions."

38. Hrdlicka, 1927.

39. Hrdlicka, 1927.

* 2 skulls.

The Harris site yielded forty-eight burials, which were found to substantiate the conclusions reached by Woodbury on the Mogollon skeleton. "The fragmentary nature of the material" made statistical study impossible, and observational data had to be relied upon. The accuracy for this sort of evidence must be taken only at its face value, for there is no method of check.

At any rate, Woodbury distinguished three physical types, that while not new to the Southwest, are seldom found together in the same site. Quoting:⁴⁰

"The majority (16) of the crania from this site combine undeformed brachycephaly with a conspicuously low cranial vault, features which appear among the Caddo and Wichita tribes of the Caddoan stock. The prehistoric people of the Mogollon site also conform to this type, which for purpose of convenience has been called the 'Caddoan' type . . .

"One specimen, which differs markedly from the others of the series, is small, undeformed, and dolichocephalic. It has become conventional to term crania of this variety 'Basketmaker' when found in the Southwest . . . for this reason and for want of a better term this skull is described as of 'Basketmaker' type.

"The third variety, represented by two female crania, has been called the 'Pueblo' type because the skulls show excessive deformation combined with natural brachycephaly and a high cranial vault so characteristic of many of the Pueblo Indian tribes, both prehistoric and present . . ."

I can see little justification for including the Mogollon people within the Caddoan type for the following reasons. Some of the anatomical and other conclusions or generalizations used by Woodbury are not reliable for he describes the Caddoan type as exhibiting "undeformed brachycephaly" while Hrdlicka, from whom his data are derived, describes the Wichita-Caddo female series as having slight to moderate occipital flattening in all skulls but one.* It is apparently for this reason that Hrdlicka does not give total averages, the deformation making it inaccurate when averaged in with the single undeformed skull. Likewise the Caddo - Wichita have not the "low cranial vault" of the Mogollon skull as Woodbury has stated, but in the words of Hrdlicka ". . . the Caddo and Wichita have a medium-high vault". Finally the series compared is too small. Woodbury had metrical data on only one Mogollon skull which he compared to a Caddoan series which at the most had only seven skulls, six of which were deformed

40. Woodbury in Haury, 1936.

* 17th century Caddoan types show extreme deformation. (W. M. Walker: A Caddo burial site at Natchitoches, Louisiana. SMC 1935.

and for this reason not comparable to the Mogollon Village people who "combine undeformed brachycephaly with a low cranial vault". In other words we are not justified in stating racial affiliations or classifying peoples into "types" when we have but a single skull upon which to base the evidence.** Comparative measurements will show that the Mogollon skull is just as similar to the Apache, Crow, and Arikara crania as it is to the Caddo-Wichita series. In view of these uncertainties and lack of data the racial type of the Mogollon Village skull is uncertain.

Neither of the Starkweather skulls conforms closely to the Pawnee series. Rather there are several marked differences notably in head length, head breadth, facial width, and nose height. The Pawnee is equipped with a larger head than either of the Starkweather crania, this being exhibited in both length and breadth. The difference in facial breadth is striking, the Starkweather skulls exhibiting marked narrowness in contrast to the Pawnee broad face. The Pawnee have also a greater nasal height and in form a nose that is sub-mesorrhinic, while both Starkweather skulls are strongly platyrrhine. In fact the only close similarities are to be found in the cranial, orbital, and upper facial indices. Starkweather No. 30 and No. 55 are both mesocephalic and the Pawnee sub-brachycephalic. There are but slight differences in orbital form, and the relation of the superior facial height to the bizygomatic width. In conclusion it would seem that there is nothing to warrant combining these two series into a single racial type.

The differences between the Starkweather skulls and the Wichita series is even more marked. This is revealed in the indices as well as in the comparative individual measurements. The Wichita males are brachycephalic, high leptorrhine, and broad faced, whereas all these characters are absent in the peoples from the Mogollon phase of Starkweather.

In general the Mogollon Village skull is not in harmony with the Starkweather series. Much of this, however, may be due to sexual difference. A few striking similarities are present, notably in facial height, narrowness of face, superior facial height, and nasal form. The Mogollon skull exhibits, however, a strong brachycephalism (index 90), which is not found in the Starkweather crania. How much of this is due to "a slight flattening of the occipital region," Woodbury⁴¹ does not say. There is also a marked difference in the height of the cranial vault. Considering the sex difference in the two series, which may have produced the variation in head

** The comparative data is also not of the same antiquity, the Mogollon material is 9th and 10th century, the Caddoan series is much later.

41. Woodbury in Haury, 1936.

shape, it would seem that on a comparative metrical basis alone that the Starkweather crania are closer to the Mogollon skull in type than to either the Pawnee or Wichita. Some conformity should be expected, considering that the Starkweather specimens are of like antiquity to those of Mogollon and Harris village, and come from the same district.

No close affinity is to be found in the comparative measurements with the surface room dwellers of Starkweather. The sharp differences in the associated cultures (Mogollon and Classic Upper Gila) suggests a change in physical type, or at least an infusion of new blood. All of the surface-room skulls show a marked deformation and a hypsicranial vault which is at sharp contrast with the mesocephalic form and lower vault of the earlier pit dwellers. Much of the loftiness of the Pueblo vault, however, is due to the artificial shortened condition of the head. Underlying this deformation there is probably a lower vault. Whether this undeformed (or slight deformation) medium vaulted mesocephalic type has a survival in the later deformed Pueblos is impossible to say without further evidence and careful chronological study. The discovery and analysis of a large pit house cemetery in the Reserve area would be an enlightening contribution to the solution of this problem. There may be a clue in the suggestion that the Mogollon peoples in Southwestern New Mexico represent an intermediate type between the dolichocephalic Basketmakers and the deformed brachycephalic Pueblos.

Summary and Conclusions

1. Two adult male skeletons from the pithouses of Starkweather ruin were sufficiently well preserved for study.
2. Cranial observations and measurements reveal several noteworthy differences in the two crania, and two related types are distinguished. Because of the smallness of the series these must be taken at face value. In general they may be described as follows:
Type 1: Mesocephalic, medium cranial vault, mesoseme orbits, narrow face and moderate occipital deformation.
Type 2: Mesocephalic, medium cranial vault, round orbits, broad face, and undeformed.
3. There is nothing primitive in the general appearance of either skull, and they seem definitely Indian.
4. The Starkweather skulls have been compared to the surface room series at the same ruin, to a Caddoan series (Wichita and Pawnee), and to the Mogollon Village skull.
5. Woodbury's conclusion that the Mogollon people are of Caddoan

type is not substantiated by the Starkweather crania. Likewise the Caddoan type as described by Woodbury is not in accord with that set forth by Hrdlicka from whom the former extracted his cranial data.

6. Comparative measurements show that the Mogollon people are just as close racially to the Apache, Crow, and Arikara as they are to any Caddoan people. This leads us only to conclude that we are not justified in assuming racial affiliations when we have but a single skull or too small a series.
7. Neither of the Starkweather skulls conforms closely to the Caddoan series, and there is nothing to warrant combining these two series into a single racial type.
8. Although there is a sexual difference between the Starkweather (male) crania and the Mogollon Village (female) skull which may account for differences in metrical measurements, on a comparative basis the Starkweather people are closer to the Mogollon than to either the Pawnee or Wichita.
9. No close affinity is to be found with the Upper Gila pueblo peoples who exhibit deformed brachycephaly, broad face and high cranial vault.
10. It is plain that considerable work needs to be done on the Mogollon physical type. Particularly do we need more skeletal material and more refined chronological study. There may be a clue in the suggestion that the Mogollon peoples represent an intermediate type between the dolichocephalic Basketmaker and the brachycephalic Pueblo.

CHAPTER VI

MATERIAL CULTURE AND CHRONOLOGY

From the information gained by the excavation of Starkweather ruin it is impossible to give a complete picture of the material culture for either the Mogollon occupancy or the later pueblo dwellers. There was a vast quantity of objects used in every-day life which by their nature had a transitory existence. Water, snow, exposure to aridity and varying temperatures have destroyed all things made from perishable materials. Because of this our knowledge of the culture of the inhabitants is based upon specimens of pottery, bone and stone implements, and objects of personal adornment. Consequently the picture of material culture as here presented is decidedly one-sided so far as recording the attainments of the Starkweather peoples.

Pottery

The ceramic collections from Starkweather village consist of the following materials:

- a. Approximately 12,000 sherds from the pitrooms and 5 complete and incomplete vessels.
- b. 302 complete specimens and several thousand sherds from the pueblo rooms and the outlying burial ground.

Because of the scarcity of complete vessels of Mogollon age the classification of wares from that horizon has been based entirely upon sherds. Sherds as well as complete specimens were used in establishing the ceramic types of the pueblo. The complete Starkweather ceramic series comprises the following types:

Mogollon red-on-brown
Three Circle red-on-white
San Francisco red
Reserve black-on-white
Tularosa black-on-white
Alma incised
Alma punched
Alma scored
Alma neck-banded
Alma plain
Upper Gila corrugated
Reserve plain
Reserve polychrome*

* A brief description of the Starkweather ceramic series appears in the appendix at the end of the book.

Coiling was the method followed in the manufacture of all the pottery listed above. For some of the early types, only sherds were available and so complete design and form analysis is not possible. Certain factors could be observed, however, and these have been included as representing a fair picture of the types. The excavations at Starkweather clearly demonstrate the relative antiquity of these wares and to each gives some importance as an horizon indicator.

Pithouse Pottery and Sequence of House Types

The producers of this pottery, the Mogollon people, held, according to Gladwin,⁴² a basic and ethnically distinct position in Southwestern prehistory. The contention has likewise been made⁴³ that they were making pottery at 1 A.D. and therefore may be the earliest producers of pottery in the Southwest. It is significant, however, that the only absolute dates we have at present are from Mogollon village and Starkweather ruin, both of which fall in the 10th century A.D. Haury⁴⁴ has found dates of 908 A.D. based on tree rings and suspects that two early phases fell before that time which were roughly coeval with Basketmaker III and Pueblo I. Starkweather ruin revealed two timbers both of the date 927 A.D.* and with indications of an earlier phase being present the temporal relations conform to that stated by Haury.

Pottery types occurring in the pithouses of Starkweather ruin are as follows:

- Mogollon red-on-brown
- Three Circle red-on-white
- San Francisco red
- Mimbres Bold Face black-on-white
- Reserve black-on-white
- Alma plain
- Alma incised
- Alma scored
- Alma punched

This series of pottery types parallels those found by Haury⁴⁵ at the Mogollon village and Harris village sites, and since Haury has so adequately described each type individually there is no need for further description here. Those not familiar with the Starkweather series will find the diagnostic elements outlined in Appendix I at the end of the book.

In the Starkweather village site the determination of the temporal re-

42. Gladwin, W & H. S., 1935.

43. Gladwin, Haury, Sayles and Gladwin, 1937.

44. Haury, 1936.

* Dated in 1936 by the Gila Pueblo, Globe, Arizona.

45. Haury, E., 1936.

lations of the various ceramic types was limited to stratigraphy. Dendrochronology served to date only the floor refuse in one room. The application of stratigraphical methods was limited to refuse accumulations in the pithouses and to irregular and shallow rubbish heaps scattered throughout the village. The refuse dumpings of the late Pueblo people, occupants of the surface dwellings, were frequently mixed in and this added to the difficulty of ascertaining sequence and time relations of pottery types. Fortunately, however, more than the usual amount of debris was found in pithouse No. A, located near the center of the village. An irregular mound rising from 10 inches to 18 inches above the surrounding terrain dotted the landscape at this point. Trenching revealed that this mound was made up of accumulated refuse and covered the upper walls of pithouse No. A. The room itself was filled with rubbish to a depth of 3 feet 6 inches. Here then was an accumulated mound of refuse approximately 5 feet in depth. It seems likely that house No. A had been abandoned early and rubbish had been used to fill in the pit. After the boundaries of the house were defined by trenching, the remaining block of refuse in the center was removed in five arbitrary levels as follows:*

Stratum	Thickness
1	1 foot 6 inches
2	1 foot
3	1 foot
4	1 foot
5	6 inches

This test yielded about 1000 sherds for analysis. The distribution of the ceramic types in sherds and according to stratum is given in Table I, and the percentages in chart form in Figure 5. In Figure 6 is shown in chart form the percentage which each type bears to the total ceramic complex of the individual stratum.

Inspection of Table I and the chart in Figure 5 shows the following:

1. Mogollon red-on-brown is absent in the lowermost stratum and makes its initial appearance in stratum No. 4. In stratum No. 3 it reaches its greatest density and decreases in volume rapidly in the upper two strata.
2. Three Circle red-on-white follows much the same time of appearance, development, and decadence as Mogollon red-on-brown.
3. Alma plain is found in all five strata and tends to remain constant throughout although there is a slight increase in density from the lower to the upper levels.

* Stratum are numbered in the order of removal.

4. San Francisco red appears initially in stratum 5 and steadily increases in volume in the upper levels.
5. Mimbres Bold Face black-on-white is absent in the lowermost strata (4 and 5), appears first in stratum 3, develops rapidly in the upper levels where it reaches its greatest density in stratum 1.
6. Reserve black-on-white appears to be a relatively late type for it is not found in the three lower strata. It is of minor significance in stratum 2 but in the uppermost level it is one of the most prevalent painted types.
7. Tularosa black-on-white is confined to the top stratum where it shares importance with Reserve black-on-white.
8. The textured types (Alma incised, Alma punched, Alma scored, Alma neck-banded reach their greatest density in the second stratum and fall off in rapidly decreasing volume in the lower layers. The wares within this type seem to be companion-wares and because of the small series they are grouped into a generic type.

Table I

Distribution of sherds according to stratum of stratigraphic test in pit-house No. A.

Pottery	Stratum					Totals
	1	2	3	4	5	
Mogollon red-on-brown	2	14	31	23	0	70
Three Circle red-on-white	2	8	10	7	0	27
Reserve plain	161	118	136	127	81	623
San Francisco red	37	33	29	14	7	120
Mimbres Bold Face	11	5	1	0	0	17
Reserve black-on-white	29	2	0	0	0	31
Tularosa black-on-white	18	0	0	0	0	18
Textured wares	17	38	19	18	2	94
Totals	277	218	226	189	90	1000

From these data it can be inferred that painted ware was unknown during the time pitroom No. A was occupied and during that period when the lowermost refuse was accumulating. Alma plain, Textured wares, and San Francisco red constituted the ceramic complex of the inhabitants of pithouse No. A, and it follows that they must be considered as the oldest pottery at Starkweather ruin. The first painted wares to appear were Mogollon red-on-brown and Three Circle red-on-white and somewhat later

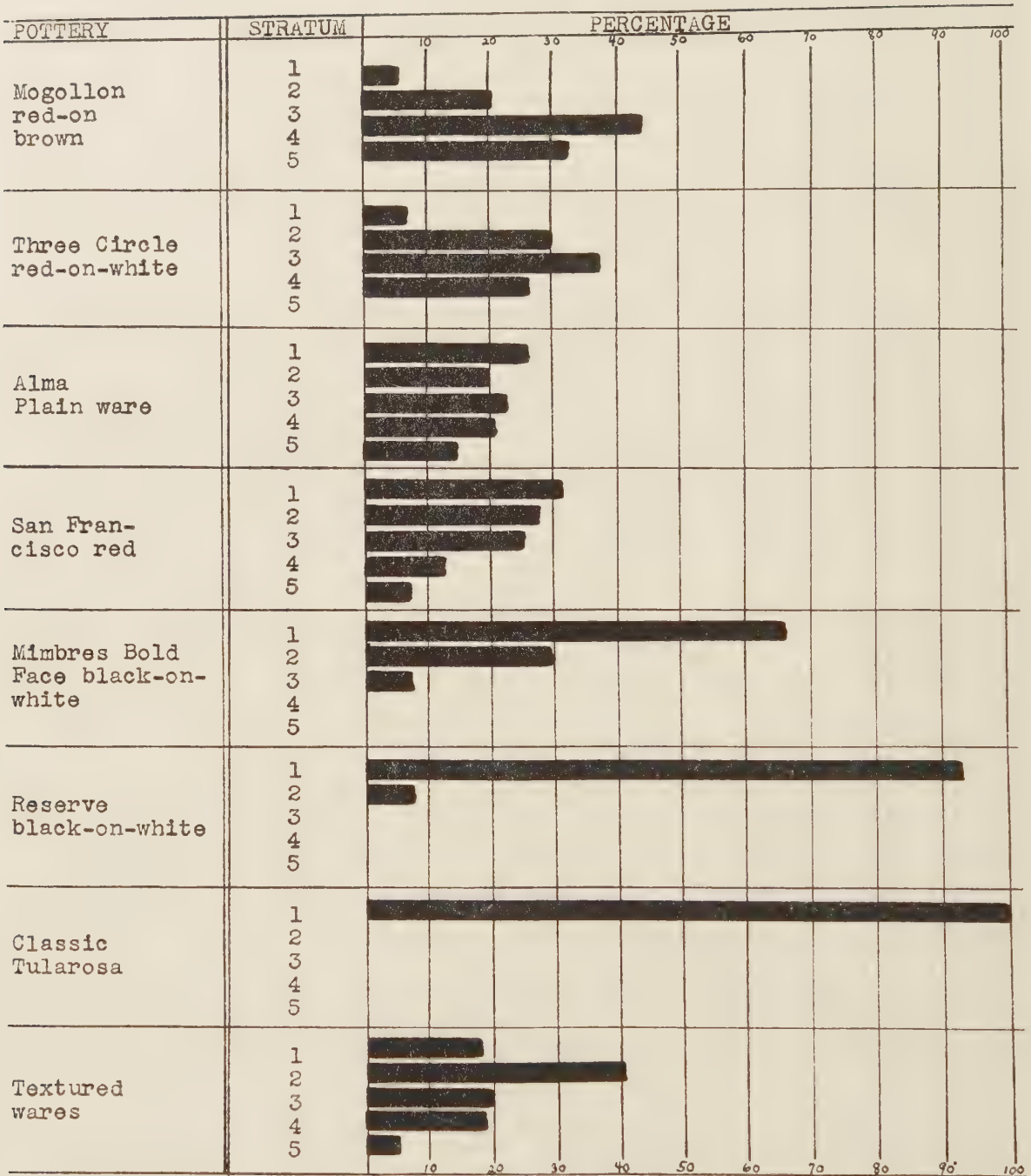


FIGURE 5.

Distribution of pottery types in percentages according to levels in rubbish of House A.

these were followed by Mimbres Bold Face black-on-white, Reserve black-on-white, and Tularosa black-on-white. With the development of these types and the increasing density of San Francisco red and Reserve plain the earlier painted wares of Mogollon red-on-brown and Three Circle red-on-white decreased in importance.

Inspection of Figure 6 reveals how relatively unimportant were the types, Mogollon red-on-brown, Three Circle red-on-white, and Mimbres Bold Face black-on-white in the total ceramic complex of Starkweather village. This holds true for all phases of occupancy whether early or late. At no time in the history of Starkweather was Mogollon red-on-brown, Three Circle red-on-white, or Mimbres Bold Face black-on-white the dominant ware. In the earliest horizon, that represented by the occupancy of room A, these wares are reduced to zero. Later in stratum No. 4, they make up, when combined, less than 16% of the pottery, 18% in level No. 3, and decrease rapidly in the uppermost layers. There is no indication of any long period of time having elapsed between the lower and the upper stratum. The predominant wares throughout all levels are Alma plain and San Francisco red and it is this pottery that best illustrates and describes the ceramic complex of Starkweather. Throughout all levels of this rubbish heap only 70 Mogollon red-on-brown, 27 Three Circle red-on-white and 17 Mimbres Bold Face black-on-white sherds were found. The fact that many of the sherds may be from the same vessel militates against their significance when expressed in percentages, particularly since the series is so small. Haury⁴⁶ found only 107 Mogollon red-on-brown, 13 Three Circle red-on-white, and 31 Mimbres Bold Face black-on-white sherds out of a total of 1700 sherds from the four levels of the rubbish heap over House I in Harris village. At the same site, from the rubbish of 10 houses of San Francisco and Three Circle age, only 59 Mogollon red-on-brown, 33 Three Circle red-on-white, and 84 Mimbres Bold Face black-on-white sherds are known from a total of 1891 sherds. In light of the scarcity of these ceramic types it seems very doubtful if we are justified in devoting such an enormous amount of classification, description, and significance to them in an understanding of the Mogollon culture complex. Culture cannot be solely defined in terms of pottery and the true perspective and picture of the situation is likely to become lost in making ceramics alone the archaeological objective.

No examples of superimposed pit-structures were noted at Starkweather. Haury, however, found several examples at the Harris village

46. Haury, 1936.

and their presence served him as his main tool in determining the sequence of house types. At Starkweather the erection of late surface rooms over abandoned and rubbish-filled pithouses substantiated, in part, the findings from the rubbish heap in the stratigraphic test pit — namely that Plain ware was the dominant pottery throughout the pit and surface room periods. San Francisco red was a very early pottery and continued strong through all periods, and Reserve black-on-white and Tularosa black-on-white are affiliated only with the pueblo dwellers. In the absence of superimposed pit-structures, the sequence of house types has been determined by the relation of the ceramics of each individual house to the pottery types from the five levels of rubbish in the stratigraphic pier above the floor of room No. A. Only sherds from the floor and the lower four inches of accumulated refuse have been included in the sherds from each room. It is believed that this material most closely correlates with the time of occupancy of the room.

I have adopted the Gila Pueblo's terminology⁴⁷ in designating the ceramic phases represented in the five levels of the stratigraphic test section as the ceramic types and their relative percentages are in keeping with those found and discerned by Haury at the Mogollon and Harris village sites. The only addition is the Classic Upper Gila phase which was not present at Mogollon village and which at Harris village has a companion in the Mimbres phase. The phases represented at Starkweather and their correlation with the strata are as follows:

Stratum	Phase
1	Late Three Circle; Classic Upper Gila.
2	Three Circle
3	San Francisco
4	San Francisco
5	Georgetown

The analysis of the ceramic types found in 16 pithouses at Starkweather ruin and their classification according to the above chronology is indicated in Table II. Inspection of this table reveals that four pithouses can, on the basis of ceramics, be placed in the Georgetown phase, eleven in the San Francisco phase, and one in the Three Circle phase. It appears, then, that Starkweather ruin was occupied during the first two phases of the Mogollon culture and during this time the village reached its greatest proportions. Before the Three Circle stage became fully developed the Starkweather pit structures had been abandoned. The difference in age

47. Gladwin, 1934; Haury, 1936.

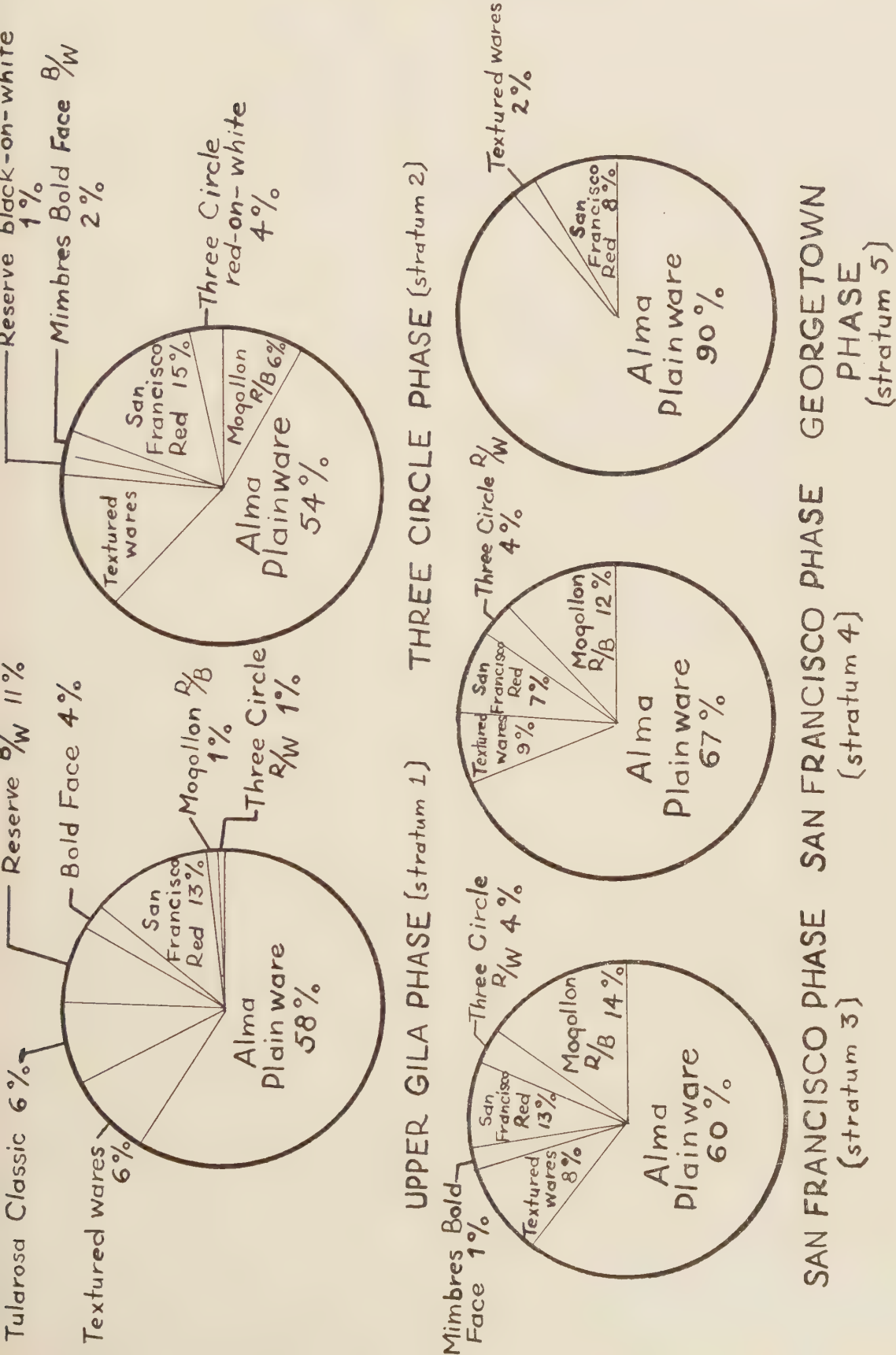


FIGURE 6.
Percentage of pottery types composing the ceramic complex of each level in House A.

between these early dwellers and the later Pueblo peoples represented by the surface dwellings is that gap left by the Three Circle phase. The presence of so many houses of the Georgetown phase at Starkweather is of particular importance as Haury expressed the belief that, in the absence of such houses at the Mogollon village, the phase was not represented in the Reserve district, but was centered to the south in the Mimbres valley. At the Harris site in this region Haury excavated five houses attributed to the Georgetown phase.⁴⁸

At the Mogollon and Harris villages there was found a close correlation between house types and ceramic phases. Architectural changes progressed more or less synchronously with pottery changes to the extent that Haury was able to distinguish each phase by its architectural style. Round domestic structures with lateral entry occurred only in the Georgetown phase; rectangular pithouses of four subtypes, all with lateral entry, occurred only in the San Francisco and Three Circle phases. Haury's descriptions are such as to suggest no great change in house types from early to late although there is a rather abrupt break between the Georgetown and San Francisco phases when the house-pit change in form from round to rectangular.

At Starkweather ruin to which we can now turn for substantiating evidence the sequence of house types, in the absence of superposition of houses, has been based primarily on ceramics. Tree ring data is known for only one room, room No. I, which yielded two specimens of the same date, 927 A.D. Ceramically room No. I belongs to the San Francisco phase. The determination of the relative ages of the house types was achieved by an analysis of the floor pottery of the individual rooms and their correlation to the phases established through the stratigraphy of pottery types in house No. A.

The architectural sequence at Starkweather does not exactly follow that established by Haury to the south in the Mimbres valley.⁴⁹ For this reason I am doubtful if the house types can be used as reliable horizon indicators. The classification of house types made in the early part of this report made no mention of the architectural sequence for the evidences to justify them could not be properly made at that point. With the ceramic evidences now having been presented it will now be advantageous to consider house types at Starkweather and their correlation with the established phases. Ceramically the architectural type represented by pithouses Nos. A, C, F, and Q is the oldest. These four houses belong to the George-

48. Haury, 1936.

49. Haury, 1936.

TABLE II
DISTRIBUTION OF POTTERY TYPES FROM 18 PITROOMS IN
THE STARKWEATHER VILLAGE

House	Mogollon red-on- brown	Three Circle red- on-white	Alma Plain ware	San. F. red	Mimbres Bold Face	Textured types	Reserve Black-on- white	Tularosa Classic B/W	Stratum correla- tion	Phase accord- ing to Gila Pueblo Terminology
A	0	0	81	7	0	2	These types were		5	Georgetown
B	11	5	208	21	0	6	found only in the		3 & 4	San Francisco
C	0	0	38	3	0	0	upper level of rub-		5	Georgetown
D	4	3	47	8	0	2	bish in the pit-		3 & 4	San Francisco
E	6	4	81	12	2	7	rooms, Stratigraph-		4	San Francisco
F	0	0	111	9	0	4	ically they are con-		5	Georgetown
G	3	0	126	4	0	6	finned to the Surface		4	San Francisco
H	10	2	72	9	1	9	room phase. This		3 & 4	San Francisco
I	7	4	217	18	2	4	is further substan-		3 & 4	San Francisco
J	3	12	87	20	3	0	tiated by their den-		2 & 3	San Francisco
K	3	2	29	2	0	0	sity in surface rooms		4	Three Circle. San Francisco
L	12	3	312	17	3	12	and as mortuary		3	San Francisco
M	16	4	168	21	5	7	offerings in the out-		3	San Francisco
N	2	4	38	3	0	1	lying burial ground.		4	San Francisco
O	6	6	102	4	0	2			4	San Francisco
P	2	6	78	9	0	7			4	San Francisco
Q	0	0	49	5	0	2			5	Georgetown
R	11	6	112	5	0	6			4	San Francisco

town phase and conform to a single architectural pattern with but few minor variations in the content of that pattern. These houses I have classified as Type I, and their diagnostic features may be described as follows:

Type I. Round Domestic Structure with Lateral Entry.

Details: Deep pit excavation varying from 3 to 4½ feet, walls bow outward, no wall plaster, no hearth, adobe floor, cache pits. Roof supports of two types: 4 corner-support posts; center and marginal. Short inclined entry.

Ceramic Phase: Primarily Georgetown and early San Francisco.

Rooms: A, C, F, and Q; I and O.

Remarks: Houses Nos. I and Q are San Francisco. House No. Q showed a bench encircling the pit.

Ceramically the next oldest houses are those belonging to the San Francisco phase. Distinction here can be made between early, middle and late occupancy through comparison of the floor pottery with the five levels in the stratigraphic test section. Seven houses are early San Francisco. In this phase two new house types appear and in rooms Nos. I and O there is the survival of the fundamental type so prevalent in the Georgetown phase. New house types to appear in the San Francisco phase are:

Type II. Round Domestic Structure with Roof Entrance.

Details: Deep pit excavation, walls straight to slightly bowing, sporadic wall plaster. Adobe floor, fire pit, cache pits. 4 corner-support posts with occasional auxiliary support. Roof entrance.

Rooms: K, N, and P.

Ceramic Phase: Early San Francisco.

Type III. Rectangular Domestic Structure with Lateral Entry.

Details: Shallow pit excavation, walls vertical to slightly bowing, occasional wall plaster. Adobe floor, firepit, cache pits. Roof supports: 4 corner; center and long axis. Long lateral entrance.

Rooms: E, G, R. Of same type but somewhat later in phase are rooms D, H, J, L and M.

Ceramic Phase: San Francisco.

From the Georgetown to the San Francisco phase the most abrupt change in house type is from the round structure with lateral entry to that which has a rectangular form. This is also accompanied by several changes in architectural details.

The presence of round structures with roof entrance is perplexing. Haury found no such house type at either the Mogollon or Harris sites. At

Starkweather it is ceramically of the same age as the earliest rectangular structure and must be accorded a place in the San Francisco phase. As a type it does not persist into the closing stages of this phase nor is it found in the Three Circle phase which follows. Its presence at Starkweather presents an inexplicable situation for this house type is architecturally opposed to the prevalent Mogollon pattern. Only a few miles west of Starkweather ruin in a pithouse village at Luna, Hough⁵⁰ reported the houses as being round and entered through the roof. Turning to the north we find that houses of this type are prevalent in Pueblo I ruins and, in some peripheral sections of the Southwest, have even survived into Pueblo II times. At Kiatuthlanna in eastern Arizona, Roberts⁵¹ excavated a series of Pueblo I pithouses which were round and possessed roof entrance and a four-post support plan. According to Haury, there is good evidence that Pueblo I at Kiatuthlanna is contemporaneous with the San Francisco phase. The Kiatuthlanna pithouses possessed some features not found at Starkweather, notably deflectors and benches. Haury mentions, however, one room at Mogollon village which had benches on two sides and at Starkweather, house No. Q showed a bench encircling the pit. Robert's earliest type at Kiatuthlanna is without the encircling bench. It consists of a small circular or oval pit whose walls were more or less vertical from the floor to the ground level. All rooms but one possessed firepit, ventilator and deflector. These houses have much in common with the structures belonging to the end of Basketmaker III period, and general similarities to this type are to be found in house No. K at Starkweather in its small circular pit, deep excavation, and four corner support posts. All of this combines in a general way to suggest that architectural concepts in the north and in the south had certain elements in common during the San Francisco phase of the Mogollon.

Judging from the evidence at hand there is an hiatus between the Mogollon type of structure and the circular pit structure with roof entrance which shows northern affiliations. There is no evidence to suggest that the peoples ceased building one form and adopted the other for the two house types are contemporaneous. Contact with another group with a distinct culture of its own might have produced this change but if so it had a short life. The middle and late stages of the San Francisco phase and the Three Circle phase which followed show no evidences of this northern house type. Houses K, N, and P are ceramically somewhat earlier than pithouse No. I which has been dated by two wood specimens, 927 A.D.

50. Hough, 1919.
51. Roberts, 1931.

Thus temporally they correlate closely with the early houses of Kiatuth-lanna.

House R comes close to being a transitional form between Type I and Type III exhibiting an irregularity in form midway between round and rectangular. The corners are rounded and not square as in the later and more characteristic houses of the San Francisco phase.

In the middle and the late stages of the San Francisco phase the prevailing house type is Type III and no round structures with roof entrance were present. Room No. H showed a variation in the location of the lateral entry, it being situated in the corner of the room and not midway along the wall as in the others. Room No. I, occupied in the San Francisco phase, showed in form a survival of the Georgetown house type. It not only had the circular form but possessed in addition a deep excavation, four corner support posts and unplastered walls. There was no evidence to suggest that this room had been constructed and used earlier by the Georgetown peoples.

Towards the end of the San Francisco phase a new house type makes its appearance, a large pit structure whose function was ceremonial. It is represented by house No. B which has already been described in detail. I have designated this Type IV and it possesses the following features:

Type IV. Round Ceremonial Structure with Lateral Entry.

Details: Large round pit, 37 feet in diameter; deep excavation, 5 feet 7 inches. Walls straight, wall plaster absent. Crude coursed masonry along south wall with remaining wall consisting of unfaced gravel. Floor uneven. Absence of firepits and cache pits. Probably not roofed over as no evidence of support posts in floor or at wall periphery. Lateral entry consisted of step terrace.

Rooms: B.

Ceramic Phase: San Francisco (late).

At Mogollon village Haury⁵² found a ceremonial structure with almost identical features. It is significant that in both ruins the ceremonial structures are without sipapu, deflectors and ventilators, features all highly characteristic of northern ceremonial chambers.

Only one house at Starkweather can be definitely attributed to the Three Circle phase. House No. J is unquestionably of this age. It conforms to Type III, rectangular with side entrance, which appeared first in the San Francisco phase. There is some variation from the early form in

⁵² Haury, 1936.

that the house tends to be square rather than rectangular and possesses a shallow pit excavation. It is not likely that a single house group established themselves here at Starkweather and although I have no direct evidence to back it up, there are probably other rooms of the Three Circle phase which were not uncovered in the trenching. The phase affiliation of houses Nos. S and T (see map) were not ascertained.

The latest form of domicile to be developed at Starkweather was the true pueblo of stone and adobe construction. Superposition showed that these rooms were later than the rectangular pithouses. The change from pithouses to pueblo rooms was too abrupt to warrant the belief that the people involved ceased building one form and adopted the other. Ceramics also point to an hiatus between the two forms of structures and there is almost as sharp a break in the material culture of the two groups as there is in house types. All of this combines to indicate that the dwellers of the rectangular pithouses abandoned the site and it was reoccupied later by a more highly advanced house building group having a distinctive culture. Abutting rooms, differences in foundation levels, and ceramic changes suggest that the pueblo had not been erected as a complete dwelling, but had grown by degrees from a small nuclear unit.

Unfortunately adequate wood specimens were not found to allow for the absolute dating of the house types and phases represented at Starkweather. Two specimens of wood from room No. I, ceramically San Francisco, showed bark dates of 927 A.D. Thirty wood specimens from several houses of transitional San Francisco-Three Circle at Mogollon village gave Haury dates ranging from 896 to 908 A.D.⁵³ The dates 900-927 A.D. would seem then to represent the final stage of the San Francisco phase. How much earlier the Georgetown phase can be pushed back is questionable. Haury⁵⁴ believes that it correlates in time with Basketmaker III and Gladwin, in the absence of additional wood dates, arbitrarily allows 200 years for each phase of the Mogollon, dating the San Francisco 700 - 900 A.D. and the Georgetown 500 - 700 A.D.⁵⁵ Frankly I cannot see the basis for the assumed great age for the Mogollon. The only valid basis for the dating of the Mogollon pattern is from the series of wood dates which we now have. It strikes me as being a bit unusual that all wood specimens, a total of thirty-two, from the Mogollon, Harris and Starkweather ruins should fall within the period 898 - 927 A.D. if still earlier horizons are present. It is true that Mogollon intrusives have been found in the lower levels at Snake-

53. Haury, in *Tree Ring Bulletin*. Vol. 4, No. 3, 1938.

54. Haury, 1936.

55. Gladwin, 1937.

town and there assumed to date between 100 to 300 B.C. but from this we can hardly postulate the antiquity of the Mogollon culture. The Mogollon complex is composed of many elements in addition to pottery, none of which have found their way into the lower levels of Snaketown. It is one thing to speak of the age of ceramic types but another to speak of the age of a culture complex such as the Mogollon. As things now stand the only ruins in which we have a complete pattern of the Mogollon culture are Mogollon village, Harris village, and Starkweather. In none of these do we have any absolute means of dating the basic phase.

At Starkweather there were no marked changes in either architecture or material culture that might not have taken place within two centuries time. In the earliest houses, those of the Georgetown phase, five intrusive sherds were found which have Basketmaker III and Pueblo I affiliations and which can be dated between 600 and 900 A.D. There is also to be considered the great likelihood of a time lag which would make these intrusives still later at Starkweather. According to Roberts* there appears to be a definite lag of from 50 to 75 years between the Chaco and the Kiatuthlanna districts and I feel certain that the same or more holds true for Starkweather. From wood dates alone, the San Francisco phase appears to belong to the late Pueblo I period and in checking over all angles of the problem I cannot see where we could possibly place the Georgetown phase any further back than Pueblo I or about 650 - 700 A.D.

The accurate dating of these phases is of the utmost importance in diagnosing the distinctive features of the Mogollon culture from the viewpoint of their origin. When we pause to consider the peripheral nature of the Mogollon complex with regard to the Basketmaker-Pueblo center many problems arise. The question of common origin of house types arises when we note that the Basketmaker III houses to the north used both side and roof entrances, houses were irregularly grouped to form a village, and that this same pattern has significant parallels in houses of the Georgetown and San Francisco phases. If the Georgetown phase is contemporaneous with early Basketmaker, diffusion of architectural features from the north is not likely. If it be of Pueblo I age suspicions are aroused, particularly when houses with roof entrances make their appearance in the phase which follows. There must not be overlooked, too, the fact that some of the lateral openings classed as entrances may actually be ventilator features.

It is hard to grasp a long Georgetown period such as that postulated by Haury and Gladwin, and I have wondered whether instead of a distinct

* In letter to writer.

stage it might not be the brief beginnings of the San Francisco that was modified by a Colonial house type coming in. I would not say that some of the elements, such as plain and red wares, could not be older than Pueblo I but so far the entire Mogollon complex has not been shown to be. The fact that Gladwin has found plain and red wares similar to Mogollon in the early levels of Snaketown only goes to show that the two groups received ceramic types from the same source, a source as yet undiscovered.

Surface Room Pottery:

The bulk of the pottery found at Starkweather came from the pueblo structure and the outlying burial ground. Sherd collections only were obtained from the pithouses. In this study of surface room pottery, sherds as well as complete vessels have been used. In the classification of the wares I have followed the general principles of nomenclature set forth by the Gila Pueblo, Globe, Arizona. The classification of the Starkweather pueblo pottery follows:

1. Reserve black-on-white (Preclassic Tularosa).
2. Tularosa black-on-white.
3. Reserve polychrome.
4. Reserve plain.
5. Upper Gila corrugated.
6. Reserve red.

Intrusive

1. Showlow black-on-red (3 sherds).
2. Wingate black-on-red (Bowl, ladle, sherds).
3. St. Johns polychrome (14 sherds).
4. Houck polychrome (3 sherds).
5. Mimbres Bold Face black-on-white (164 sherds).
6. Mimbres Classic black-on-white (1 bowl, 11 sherds).
7. Mimbres polychrome (11 sherds).

The majority of the pueblo ruins in the Reserve district are thought to belong to Pueblo III horizon. Black-on-white pottery, Plates 29-33, is to be found at most of the ruins and, judging from its stratigraphical position at Starkweather, its development was a slow and gradual one being altered primarily by outside influences. Because of its distinctive design elements and the fact that it is concentrated in the Tularosa region this black-on-white pottery has been termed "Tularosa." At Starkweather it was preceded by an earlier related type, probably ancestral, Reserve black-on-white. In the fill of pithouses Reserve black-on-white is earlier than Tularosa black-on-white. Its position is such as to warrant its being placed in Pueblo II horizon whereas its derivative, Tularosa black-on-white, is unquestionably Pueblo III.

The paste from which the black-on-white pottery is made is of an even texture, tempered with fine sand and finely ground sherd material. It has a hardness of 4. In color it ranges from a bright white to a dull gray. The slip is a distinct white with traces of blue sometimes appearing faintly, possibly due to contact with the open flame. The slip tends to wear through on the bottoms of vessels although crackling is not a characteristic. The pigment is a dense black with over-firing producing brown in some instances. It is a carbon paint of vegetal extract with the addition of iron oxide. The interiors of bowls are usually smooth but the exteriors are frequently characterized by lumpy modeling.

Early vessel shapes are bowls, pitchers, jugs and eccentric forms. Reserve black-on-white pitchers invariably have flat handles. Somewhat later the ladle is added to the list of vessel forms. The other forms continue with but few modifications although the flat or rounded handles of pitchers are often modified into the shape of an animal. The brushwork of Reserve black-on-white is mediocre and the designs appear on the interior of bowls and the exterior of all other shapes. In contrast, the brushwork of the Tularosa painted pottery is excellent, and paint was applied to the interiors of bowls and ladles, and the exteriors of pitchers, jugs and eccentric forms.

Bowls are shallow and symmetrical with the exception of one which is ovoid in shape (Plate 32a). In size they vary from a width of $5\frac{1}{2}$ inches to 10 inches at the rim, and in depth from $3\frac{1}{2}$ inches to $4\frac{1}{2}$ inches. The rims are straight with no in or out-curving nor any intentional flattening or broadening. There are, however, several decorative styles in the treatment of the rims. The majority are ticked with black, a few are solid black, and some left undecorated. The design appears on the interior only. The design elements are closely related to those appearing on pitchers and comprise angular and curvilinear designs, interlocking designs of balanced solid and hatched elements, herring-bone lines, and small key figures. Some early bowls show triangles pendant from rims and occasional all-over designs. All-over designs are usually composed of the same element repeated four or five times. Banding and quadrate division are also common. Banded designs appear as single bands reaching from the rim to over half-way down the side, and as double bands one below the other (Plate 29b,c). The quadrate division shows variations, one form consists of two elements, each of which is repeated four times (Plate 32e) while another form is composed of two elements each of which is repeated twice (Plate 32d). The banded and quadrate forms leave a plain, undecorated space at the bottom. In the case of the banded designs this space is circular, in the quadrate the space is square (Plates 32d,e).

Pitchers (Plates 30, 31, 33) occur in almost the same numbers as bowls, particularly in the late strata. No very large forms occur in this group, the pitchers ranging from 5½ inches to 8½ inches in height. The greatest width occurs just below the shoulder and ranges from 6 to 8 inches. The degree of variation of body form, lip and rim curve, and size is illustrated in Plates 30, 31, 33. A white slip was applied to the exterior of pitchers and to the interior as far as the base of the neck. The most common design elements are interlocking key figures, and balanced solid and hatched elements. These two motifs greatly outnumber any other although a few examples of interlocking and balanced spirals occur. Checkerboard design was used only once and the cross appears twice (Plate 30a, 31a). The shoulder of the pitcher was not a design zone except in all-over treatment. As a rule the design is limited to the body, neck, rim, and handle. Normally in the case of zoned designs the decoration consists of a banded pattern. The bands are divided in order to minimize the space to be decorated and to produce a distinctive pattern. Various methods of dividing were employed, the most common being the division into rectangles through the use of vertical hatching or narrow undecorated spaces (Plate 34a). Quite different is the zig-zag line dividing the band into triangles which are then filled in (Plate 34c). This method is varied by a stepped-line which divides the band into areas of solid figures (Plate 34d). Again, opposed figures may form a complete unit (Plate 34b). Pendant triangles and key figures are common rim elements where banding is not used (Plate 30, 31). Handle designs have no close relation to the design elements on the vessel except in the case of the all-over design where the same pattern also covers the handle.

According to Gladwin,⁵⁶ a common feature of Upper Gila pitchers, occurring in forty to fifty percent of all specimens, is the modification of the handle into the crudely modeled form of a small animal. The entire body of the animal may be shown, or the handle may be reduced to a small protuberance representing the head and neck. This feature is not common on the pitchers from Starkweather. No examples are present in the Reserve black-on-white and only a few in the Tularosa black-on-white (Plate 30,c; 33a,b,c.). Later ruins in the same district exhibit the modified handle in large numbers.* It would seem that these modeled features are a late development of Tularosa Classic while the pitchers discussed here are their prototype, preclassic Tularosa.

56. Gladwin, 1931.

* Particularly those ruins in the Reserve district excavated by the University of Minnesota.

The presence of only one olla form in the entire black-on-white group marks it as an eccentric form. Its measurements conform to those of the small pitchers being $5\frac{3}{4}$ inches high and $5\frac{1}{2}$ inches at the point of greatest width. The slip was applied over the same area as on the pitchers and the design which covers the entire vessel is made up of three bands, each of which contains a distinctive set of elements. These elements are similar to those which appear on pitchers and design division is also the same. There is also a modified olla form, somewhat smaller, which has a shortened neck and is further altered by a swelling which gives it a lobed appearance (Plates 31g). The design elements are similar to those of the olla but restricted to two zones, one covering the body and shoulders and an independent element at the vessel neck. The design is so zoned that the undecorated slip on the bottom takes the form of a star. Pitcher bottoms received no special treatment of this sort even in the case of the all-over design. A third eccentric form is a small three-lobed, handled vessel measuring $3\frac{1}{2}$ inches high, and $2\frac{3}{4}$ inches wide. Each lobe, the neck and the handle carry design elements, those of the neck and two lobes being the same while the handle and remaining lobe carry a different element (Plate 31b).

Tularosa Classic black-on-white vessels frequently assume an effigy form. From a late burial at Starkweather came one rather unusual form in which the vessel is in the form of a duck, being both shaped and painted to represent this bird (Plate 30e). It is about the size of the large pitchers and is broadened at the front to represent the breast and posteriorly a tail is modeled. The handle reaching from rim to shoulder is undulated, varying in this way from the more characteristic handle. Ladles are rare at Starkweather and unquestionably belong to the Classic Tularosa period. None was found that would warrant contemporaneity with Reserve black-on-white. In the Tularosa horizon they occur in two forms. One is a half-gourd shape with open handle and the second possesses an elliptical bowl and a short solid handle terminated by a simple effigy figure. A slip occurs on both the interior and the exterior although the design appears on the interior only.

I agree with Gladwin⁵⁷ that the status of the Tularosa pottery is of the greatest importance in outlining the nature of the Upper Gila and Little Colorado cultures. Gladwin suggests, and the evidences are further substantiated at Starkweather, that while the Tularosa wares are known to occur in the Upper Gila drainage they actually are a derivative from the Little Colorado pottery.

57. Gladwin, 1931.

At Starkweather the chronological position of the Classic Tularosa black-on-white is indicated by a) Its superposition over Pueblo I and II pottery in the stratigraphic test section b) By intrusive Little Colorado and Mimbres sherds, and c) The relation of the design elements to the wares of the Little Colorado area, particularly to Puerco black-on-white. In the Little Colorado area, Puerco black-on-white, an older type than Tularosa, exhibits designs almost identical. Longitudinal hatching is the characteristic design of Puerco black-on-white and this element is also prevalent on Tularosa bowls. Vessel forms are also similar. Based solely upon design elements and vessel forms it would seem then that the Tularosa type was derived from a source close to the Puerco black-on-white and its appearance in the Reserve district is due to the extension of the Little Colorado culture rather than an autochthonous development of the Upper Gila. Oblique hatching which is common on Tularosa bowls seems also to be the result of northern influence, probably from San Juan black-on-white. At Starkweather intrusive sherds of St. Johns polychrome were found with Tularosa black-on-white but were not found associated with Reserve black-on-white. This suggests that the preclassic Tularosa is somewhat older than St. John's polychrome. I agree with Gladwin,⁵⁸ however, that the close relationship of these two wares seems to be the joint development of those characteristics which have been incorporated in earlier Colorado wares as Puerco black-on-white. The Tularosa black-on-white also shows a close resemblance to the Roosevelt black-on-white of the Little Colorado area.

All of these evidences suggest that the Tularosa black-on-white is not natively Upper Gila but represents a southern extension of the Little Colorado pottery. Ceramically then the Upper Gila region has no Pueblo III painted wares which are not descended from the Little Colorado region. Its ceramic culture has only plain and corrugated wares to distinguish it. The Upper Gila area as described by Kidder would seem to be, then, a peripheral zone of the Little Colorado area and not a separate area of specialization.

Reserve Plain: (Plates 35, 36).

The Upper Gila plain ware appears to be a regional type which owes its origin to Alma plain which occurs in all stages of the pithouse culture at Starkweather. Tularosa fillet-rim, a distinctive regional type, is likewise a derivative. Tularosa fillet-rim differs from that ceramic type which I have designated Reserve plain only in the treatment of the rim and the two can be considered as companion wares. Reserve plain is reddish-brown in

58. Gladwin, 1931.

color on the exterior and has a deep lustrous black interior. It has a hardness of 4, contains mica and sand tempering, and has a smooth surface which often is highly polished. The smudged-black interior sets this type off from Alma plain from which it is descended. Wiping marks are common on the exterior of bowls and occasional firing-clouds are present. The wiping marks and mica tempering are like that of the Gila Plain ware described by Gladwin⁵⁹ but aside from this there are no close similarities. The paste is much finer and harder than that of the Gila Plain and in addition carries firing-clouds and black interiors, both lacking in the Gila plain. Likewise, Santa Cruz red-on-buff, a companion to the Gila plain is not found with the Upper Gila variety.

Vessel shapes are few in number. Bowls predominate, ollas are rare and there was only one seed-bowl found. The surface is without any decoration unless the firing-clouds were intended for that purpose.

Tularosa fillet rim appears to be a later development of the unmodified rim. Stratigraphically they appear together at Starkweather but there is an increasing number of pieces with fillet rim in the uppermost stratum.

Reserve polychrome: (Plate 37b).

This type is a development out of Reserve plain through the influence of St. John's polychrome. From the former it derived its unslipped reddish brown exterior and polished black interior. From the St. Johns polychrome it derived its white pigment and design elements. The only vessel shape known to date is the bowl (Plate 38b). The fillet rim is common.

Decoration consists of white pigment applied to the exterior of bowls and occasionally the interior but never on both surfaces. Designs comprise solid stepped elements, and solid rectilinear lines ending in a key. The motif is usually enclosed within encircling bands near bottom and at rim. The brushwork is excellent.

Reserve Red: (Plate 38).

This pottery which is so plentiful in pueblo ruins of the San Francisco and Tularosa rivers is a regional type which owes its origin to the earlier San Francisco red. The texture and composition of the paste, and the similarity in color indicate a rather close relationship to the pithouse type of red pottery.

In color the ware is a bright red tending in some cases to brown. Wiping marks are common as are also firing-clouds. These features are absent on San Francisco red but have parallels in the Reserve plain, suggesting that

59. Gladwin, 1933.

locally they are companion wares. In these features the Reserve red ware has close resemblances in the Sacatan red described by Gladwin. It differs, however, in having a polished surface finish, which the Sacatan red never has, and by absence of black interior.

Vessel forms include bowls, ladles, seed-bowls, and globular jars with restricted orifice. Bowls with fillet rim are common.

Upper Gila Corrugated: (Plates 39, 40).

In many respects, particularly in paste, hardness, and vessel shapes this ware is similar to Reserve plain. The two appear together as companion wares at Starkweather and both are late descendants from Alma plain. It seems also to be related to the corrugated wares of the Little Colorado and Middle Gila.

The Upper Gila corrugated is distinctive only in that varying surface effects were achieved during the process of making and finishing.

Color ranges from various shades of brown to black on the exterior. The interior of bowls are smudged and polished. Vessel shapes comprise bowls, jugs, and large ollas. Bowls are variable in form running from shallow bowls to deep bowls with straight sides and flat to convex bottoms. The jugs are small and the ollas very large.

Corrugated vessels which are stratigraphically early show corrugations confined to the neck region. All-over corrugations and greater varieties of treatment characterize the late forms. Here the entire exterior surface is composed of corrugations and in some instances the interior carries a high polish. The coils are frequently indented or waved to produce a decorative effect and incised lines occasionally are made over the coils.

The olla is the most common form. They range in size from a miniature form measuring $3\frac{1}{2}$ inches high to one measuring 16 inches high. The corrugations are regular and small, averaging between 5 and 7 to the inch.

Additional Clay Objects

This group consists of crudely and simply formed miniature effigies, scrapers used in smoothing down pottery, and round clay discs with or without perforations (Plate 43). Except for the effigies all of these specimens were made from fragments of broken vessels characteristic of the period. At Starkweather they were confined to the pueblo horizon and were fashioned from potsherds characteristic of that time. Their absence in the pithouses is surprising in view of the fact that Haury⁶⁰ found pipes,

60. Haury, 1936.

cornucopia-shaped objects, and a miniature ladle in the Mogollon and Harris sites.

Clay effigies come from the pueblo and the associated outlying burial ground. One was found in association with sherds of the Three Circle Phase but as it is the only example it is probably intrusive. These objects are irregularly modeled from lumps of untempered clay and the workmanship is of such poor nature that it is impossible to identify the animal forms. One form (Plate 42, Fig. F) depicts the mountain lion, symbolized by the tail curved back over the head. This form is more commonly found to the south, particularly in the Mimbres Valley.⁶¹ As a group they are characterized by a single perforation extending from the base of the head to the base of the tail.

Basketry

One poorly preserved basket (Plate 25b), from the burial ground, indicates that the inhabitants of the pueblo had containers other than clay. No data was obtained on the earlier pithouse dwellers. The basket in question was found as a mortuary offering. It had been placed in a large corrugated olla and capped with a smaller bowl. Because of its disintegrated condition it was impossible to determine exactly what materials were used in its manufacture. It was built up by the coil method, of the double-rod foundation type, and the rods appeared to be small willows.

Stone Objects

Tools and other objects of stone which the dwellers of Starkweather used comprise a variety of forms and illustrate two methods of manufacture—(a) pecking and grinding and (b) chipping. The pecking and grinding list includes metates, manos, axe heads, mauls, stone pipes, polishing and abrading stones, stone vessels, simple and carved stone slabs, and problematical objects. The chipped implements comprise projectile points, drills, knives, scrapers, and hoes. In both groups there are a number of differences to be noted between the pithouse and pueblo forms. Few differences exist, however, within the three horizons of the pitroom culture.

Metates or milling stones upon which the corn was ground are of three types:

- Type 1. Irregular and unshaped block of lava stone with oblong grinding surface and basin or cup-like depression in the middle. (Plate 10b).

⁶¹ Nesbitt, 1931; Cosgrove, 1932.

This type is based upon one incomplete specimen from pitroom G, a San Francisco house. It shows some resemblances to an early type found by Haury at Mogollon.⁶²

Type 2. Irregular-shaped rocker type, closed at one end, and with limited grinding axis. There is considerable variation in size, ranging 16 inches to 20 inches in length, 12 inches to 16 inches in width. Thickest point is near the center where the average is 5 inches; from here it tapers off to 2 inches at the ends. Sides are parallel (Plate 15a).

Metates of this type are found in both the pithouses and the pueblo structure. In the latter dwellings, they are frequently enclosed in bins.

Type 3. Shaped block of lava rock or sandstone, full trough. Grinding along one axis which produced parallel sides. Greater regularity in thickness and thus different from the rocker-type. Conforms in size to Type 2. Trough open on both ends. (Pl. 15a).

Metates of this type are confined to the pueblo houses where they appeared both in connection with bins or were elevated on small stones above the floor. Clay containers were frequently imbedded in the floor at the open ends. (Plate 15a).

A parallel may be drawn between the Starkweather metates and those found by Cosgrove at Swarts ruin in the Mimbres valley. The Cosgroves present a remarkable developmental group tracing the origins of classic forms from the primitive mortar. Starkweather Type 1 milling stone and ensuing forms indicate that here a similar development has taken place. The existence of intermediate forms may be inferred. In general, Starkweather metates progress in size and efficiency of groove as they advance in age. The classic type, Type 3, seems to have been finally reached by the continual extension of stroke of the the turtle-back mano. The classic type is not particularly numerous in the Upper Gila, and forms intermediate between it and Type 2 predominate. Type 2 and variations from it were found in pithouses of San Francisco and Three Circle age and formed the most prevalent type in the pueblo horizon. Type 3 was not found in the pithouses and it is rare in the pueblo phase. Wilford, however, found a large number in Upper Gila ruins of more classic age.* The absence of metates in houses of the Georgetown Phase suggests that the pioneer settlers at Starkweather may have depended more upon hunting than cultivated plants for their subsistence. The pecking and grinding method was employed in making metates and the materials most frequently used were lava rock and sandstone.

62. Haury, 1936.

* Personal observations at Hudson ranch ruin excavated by the University of Minnesota.

An interesting mano culture was found at Starkweather ruin. As a result of the discovery of caches in both pit and pueblo houses, a definite development of this implement can be traced. Manos of the pithouses show diversity of shapes. The round river-boulder or disc type of mano (Pl. 43a-d) with convex grinding surface is the earliest, appearing first in the San Francisco Phase. It is followed by oval and rectangular forms (Pl. 43e-k). This sequence agrees in general with that of the Cosgroves⁶³ for Swarts ruin and that of Haury⁶⁴ for Mogollon village. As time went on the disc type passed into the turtle-back, rocker-bottom mano, and finally the flat, rectangular specimens were reached. In the later types, concave grooves are frequently pecked in the sides for finger placement.

Correlation of manos and metates

Metate

Mano

- Type 1. Round, disc and ball shape with convex grinding surface.
 2. Elliptical turtle-back.
 3. Elliptical turtle-back; rectangular and flat.

The early disc type mano consists of an extremely hard crystalline limestone with no impurities or concretions. In Types 2 and 3 no one material predominates; basalt, indurated sandstone, granite, and scoria comprise the classification. An extremely fine scoria, almost pumice, was used for exceptionally fine manos of the late type. (Pl. 44-h, i).

A single large mortar, measuring 11 inches in diameter and 10 inches in height, was found in the outlying pueblo burial ground. It rested on the pelvis of a female interment. As this was the only example found, it is doubtful if mortars played an important part in the stone culture. They might have been used occasionally for grinding nuts, seeds, and perhaps the initial steps in crushing dry grain.

Mauls from Starkweather are of two forms (Pl. 44). One is cylindrical to elliptical in shape and the groove for hafting completely encircles the stone. The other type possesses the same shapes but the groove appears on only three sides. Where the shape is cylindrical the ends are rounded, when elliptical they tend to be flattened. Materials used in making mauls comprise lava, limestone, and granite. The first named is predominant. Both types conform to the same size, averaging $4\frac{1}{2}$ inches in length for the cylindrical variety and $6\frac{1}{2}$ inches for the more elongated. No mauls were found in houses of the Georgetown Phase but both types are present in the San Francisco and Three Circle periods. The cylindrical form is replaced almost completely by the elongated in the pueblo phase.

63. Cosgrove, 1932.

64. Haury, 1936.

Both three-quarter and full-grooving extend from the San Francisco into the pueblo. That the cylindrical, full-grooved type is extremely early is testified by its wide distribution and consistent presence in Basketmaker III and Pueblo I sites in the San Juan area. The three-quarter grooved type, ordinarily believed to be late, is, at Starkweather, contemporaneous with the cylindrical full-grooved form. A shouldered-groove type, illustrated by Haury⁶⁵ from the Mogollon village is not present at Starkweather.

Only five specimens of axes were found and they comprise two distinct types. The first is a full-grooved, short-bitted type (Pl. 45, i, j, k) and the other is three-quarter grooved and possesses a long blade (Pl. 44, l, m.) Both were shaped by the grinding and pecking method. The materials used were diorite and greenstone. The short-bitted type shows some evidence of beading, a ridge effect produced by regrinding the surface toward the cutting edge. Axes of this type are commonly found to the north in Basketmaker III and Pueblo I deposits. Considering their almost complete absence in the south, it is not improbable that the Mogollon axes were the result of northern influence. The type, illustrated by Roberts,⁶⁶ from Kiatuthlanna is identical. The full-grooved, short-bitted type appeared in Houses L and M, both of the San Francisco Phase. As a type, it seems to have been discontinued before the pueblo was built. The three-quarter groove axe was associated only with remains of the pueblo phase. The angular and notched type, illustrated by Haury⁶⁷ from Harris village, was not present.

Several poorly-made stone bowls were found in pithouses of the San Francisco Phase (Pl. 45a, b, c). All specimens were crudely finished and show a wide range in size. None possesses the fine workmanship of those uncovered by Roberts in the Pueblo I pithouses of Kiatuthlanna.⁶⁸ Those illustrated by Haury from Mogollon village are likewise of inferior workmanship. Only in the Pueblo III ruins of the Upper Gila and Mimbres regions do comparable forms appear. This suggests that stone bowls are earlier in the northern regions and eventually were carried south where the idea reached full bloom in the Mimbres Phase and the Classic Upper Gila. There is no evidence of movement in the opposite direction for stone bowls are absent in the communal dwellings of Kiatuthlanna and at Starkweather, they are confined to the pithouse stage. The Hohokam region seems to have been an early center for stone vessels, although here the type is somewhat different, running to carved and zoomorphic types.

65. Haury, 1936.

66. Roberts, 1931. Pl. 33.

67. Haury, 1936. Pl. 31.

68. Roberts, 1931. Pl. 34.

This area seems to have influenced, considerably, the Mimbres forms. The use or function of these bowls could not be determined. Materials from which they are made consist of limestone, lava, and granite.

The only pipes which were found at Starkweather were those which were made from stone (Pl. 45 e, f.). The tubular clay pipes so frequent in regions to the north are absent. The stone pipes are all of one type—the tubular or cylindrical. Most of them were recovered from houses of San Francisco age. One specimen (Pl. 45f) from a San Francisco Phase pit-house is particularly interesting because it has, inserted at one end, the original bone stem. This pipe is almost an exact duplicate of that illustrated by Roberts⁶⁹ from the pithouse era of Kiatuthlanna. Stone pipes have a wide distribution and occur early in northern Basketmaker and Pueblo horizons. During Pueblo III they seem to be more characteristic of the southern and western regions, although at no times did the people of the Hohokam employ them. No examples were found in the pueblo rooms which is surprising in view of the fact that long tubular pipes occur a short distance south in the Mimbres.⁷⁰

In the group I have designated as rubbing stones (Pl. 45g-j) is included an extensive series of polishing and abrading stones, usually diorite, basalt, or quartz, that show smoothed surfaces where they have been used as polishing agents for pottery containers. Modern Pueblo women may use the same pebble for a life-time to polish their vessels, so it is not strange that the pressure should wear the comparatively hard stone. Other polishing stones which are larger and usually disc-shaped, were used to smooth new stone axes and mauls. Polishing stones are associated with both pithouse and pueblo remains. Abrading stones with one or more smooth grooves on the side, and whose purpose was to polish arrowshafts and bone points, appear first in houses of the San Francisco Phase and continue through the pueblo stage. Materials used are sandstone and limestone. Potsherds were also utilized for various rubbing and polishing purposes.

Stone slabs occur in large numbers at Starkweather, and as Fewkes⁷¹ and Hough⁷² have pointed out, they seem to be particularly characteristic of the Upper Gila and Little Colorado regions. They occur in two forms, simple and uncarved, and those which are carved in elaborate fashion. There are no examples of painted forms such as those described by Hough. Both forms are found only in the pueblo horizon. A considerable number

69. Roberts, 1931. Pl. 40, a.

70. Nesbitt, 1931. Cosgrove, 1932.

71. Fewkes, 1904.

72. Hough, 1914.

of large, uncarved, rectangular slabs were found in the pueblo rooms. They are of uniform size, rarely exceeding 2 feet in length and 1 foot in width, and are made from a partly-metamorphosed schist and flaky granite rock. They average about three-quarters of an inch in thickness and are usually found lying on the room floors. They were probably used for the kneading of dough and for metate bins. The elaborately carved stone slab shown in Plate 16b was found on the floor of pueblo house 8. Its position suggested that it was employed as a seal-stone to block up the passageway connecting rooms 8 and 9. The carving is that of a male figure and is on a rectangular slab of laminated sandstone. The slab is $16\frac{3}{4}$ inches in length, and $13\frac{1}{4}$ inches in width, and 2 inches in thickness. The borders have been carefully dressed and beveled, and the bottom smoothly faced. The relief ranges in height from three-eighths of an inch to one half inch. The figure, with right arm and hand raised in "Nazi salute" fashion, is simply executed. Proper perspective is lacking and the head is indicated in simple style. Yet the creator was thorough in details as verified by the eyes, nose, mouth, and the fingers of the extended right hand. Due to the age and softness of the stone, some of the features are partially obliterated. There is no suggestion of pigment having been applied as is so frequently the case in those of the Little Colorado area described by Fewkes.⁷³ Although the design is highly suggestive and of a symbolic nature, any interpretation of the figure would be conjectural.

One of the burials belonging to the pueblo horizon was accompanied, in addition to mortuary pottery, by a well-executed sandstone paddle (Plate 46). So far as I am aware—it is unique in the ruins of the Southwest. Its use is problematical, for the surface gives no evidence of wear. It may have seen service as a ceremonial object. In length it measures 11 inches, and the width across the circular section is $6\frac{1}{2}$ inches.

Bright pebbles and crystalline forms of quartz undoubtedly attracted the pueblo and pithouse dwellers, for many bits of stone of this nature are to be found. In room 3, pueblo phase, several quartz crystals were found at the bottom of postholes.

The chipped implements comprise several types of tools—projectile points, knives, drills, and scrapers. They are made from a variety of materials, the following being represented at Starkweather: chalcedony 16%, flint and chert 27%, obsidian 20% and felsite 37%. The employment of these materials seems to be entirely due to the geological nature of the Reserve area which is dominantly igneous.

73. Fewkes, 1904.

Drills, knives, and scrapers from the pithouse horizon are illustrated in Plate 47. A typical example of the style of drill employed is shown by d; c, a more simple type is less common. Scrapers are of two varieties—the disc form and the elongated sidescraper (Pl. 47n-r). There are considerable variations in the forms of the knife blades as specimens f to m show. The triangular type of blade appears most frequently, although the narrow blade with parallel sides is commonly found. Retouching appears along the edges, and occasionally the triangular forms are stemmed. The above chipped objects are assignable to houses of the Georgetown and San Francisco Phases. Knives, drills, and scrapers were not so numerous in the pueblo horizon, and are, for the most part, represented by fragments. Some of the pithouse knife forms continue into the pueblo phase, but there is an absence of drill forms. Obsidian, as a material, was more common in the pueblo phase.

A characteristic group of projectile points from the pithouse horizon is shown in Plate 47a. They are associated with remains of the Georgetown and San Francisco Phases. The majority of the specimens have notches and expanding stems although in occasional pieces the sides of the stem are parallel. The base of the stem is either straight or convex, never concave. From the standpoint of type and size they are quite different from those of the pueblo horizon although an occasional form overlaps. The pithouse points are larger than those of the pueblo which is consistent with the belief that during the early periods in the Southwest, the spear was more prevalent than the bow and arrow. In the pueblo horizon, there was a decrease in the use of the larger points and an increase in the use of arrowheads.

Projectile points associated with remains of the pueblo houses are illustrated in Plate 47b. This group is of particular interest because it shows distinct differences from the pitroom variety. The points are not only smaller but frequently show serration of the edges, notching of the base and occasional down-raking barks. The typical pithouse points were without these features. Materials used also differ. The pueblo points are made mostly from crystalline quartz and obsidian, whereas felsite predominates in the earlier forms.

Bone Objects

The bone objects from Starkweather do not exhibit a great diversity of forms. The majority of the specimens are awls made from the distal ends of deer metapodials split down the middle. Certain distinctions can be made within tools of this type. In some the head of the bone has been

split but otherwise unworked, some were fashioned from splinters, and still others were intentionally cut and shaped. There are some differences between the implements from the pithouses and those from the pueblo. The pueblo peoples had forms not present in the pitroom series, and, conversely, pithouse dwellers used forms not present in the later period.

The awls of the pithouse horizon embrace the following types:

Type 1. Awls with side-notch. Plate 48e.

2. Awls without side-notch. In general, show additional shaping along body. Plate 48.

3. Unworked bone splinters. Plate 48.

The notched type is of particular interest because of its narrow geographical distribution which seems to be concentrated in the southern portion of the Southwest. Haury found several examples at the Mogollon and Harris village⁷⁴ sites, and Roberts illustrates one from Kiatuthlanna.⁷⁵ In both the Upper Gila and Mimbres areas it carries through from the San Francisco Phase to Classic Pueblo. At Starkweather type 2 is the form most frequently met with, and it occurs in both horizons.

The awls of the pueblo era exhibit some differences from those of the earlier horizon. They show additional rubbing and polishing which, in some specimens, extends from the point to several inches down the body. They are also less stubby, tending to longer and narrower shapes. Of particular interest are two bone awls (Plate 48 f, g), made from the unsplit metapodials of the deer, which were found along with other mortuary offerings, in a pueblo grave. They show rubbing, polishing and marked modification of the original bone along the upper halves of their shafts which are respectively 9 inches and 10 inches in length. Awls made from fortuitous splinters occur here as well as in the pithouses.

A long and slender spatulate-shaped implement with a deep notch at the base (Plate 48h) comes from the pueblo horizon. It is made from the split metapodial of the deer and displays little modification of the original bone. It shows no polishing or rubbing other than that which was acquired through use.

Another implement confined to the late phase of Starkweather is the needle or spatulate awl, a rather long and flat bone, finely worked and polished, pointed at one end and perforated at the other (Plate 48k). Such a tool would have been serviceable in both weaving and sewing.

74. Haury, 1936.
75. Roberts, 1931.

From the pueblo burial ground was recovered a bone implement that served as a shaft polisher (Plate 49,o). It has four perforations of graded sizes but otherwise shows no modification. The specimen is not complete, and knife marks along the edges suggest that it may have terminated in a point.

Ornaments of Shell, Stone, and Clay

Plates 49, 50.

Either as the result of trade or extensive journeys, the Starkweather peoples had a large quantity of shell from which they made a variety of ornaments. The shell used in the manufacture of most objects is found only in the Gulf of California, others suggest the Texas coast as a possible source. All of which indicates contacts between widely separated regions.

No examples of shells were found in pithouses of the Georgetown Phase and only fragmentary pieces in those of San Francisco age. On the other hand, in the pueblo houses and in the associated burial ground shell objects were numerous and diversified. Shells most frequently used were *Olivella*, *Glycymeris*, and *Conus Californicus*.^{*} The specific objects represented are bracelets, wristlets, pendants, and beads (Plates 49, 50).

Of shell bracelets, 14 complete and 32 incomplete fragments were found (Pl. 49). They were made from varying - sized *Glycymeris* shells and produced by cutting away the body of the shell, leaving the edge as a ring. The fragments of 6 bracelets were found in houses of San Francisco age, and they differ from the pueblo forms in being smaller in size and having thinner bodies. Bracelets of the pueblo horizon were larger, thicker, and frequently ornamented with incised lines. The majority were found in pueblo graves while a few fragmentary specimens occurred in the upper levels of the rubbish heaps. Less use was made of bracelets, however, than in the regions to the south and west.

Only a few pendant forms were found, all from the pueblo horizon. The characteristic forms are illustrated in Plates 49, 50. Objects c, d, and e, Pl. 49, were made from *Glycymeris* shell, and c, Pl. 50, a simple pendant with perforation at hinge, from *Pecten* shell. Dr. M. Wing of Beloit College has identified the latter as *Pecten gibbus irradians*, whose range is from New Jersey to Texas. Specimens d and e formed a pair which were found with burial 29 in the late refuse of pitroom C. The series of grooves in specimen c, Pl. 50, are natural, the only modification of the original shell

^{*} Identified by Dr. Monte Wing, Beloit College.
76. Fewkes, 1904; Nesbitt, 1931; Cosgrove, 1932.

occurs in the perforation. Pendants, such as these, in which animal forms are represented, are commonly found in the Mimbres and Little Colorado areas.⁷⁶

The most entrancing and interesting objects of personal adornment are the minute stone, clay, and shell beads (Pl. 50b, d), which show an excellence of workmanship superior to that of modern Pueblo Indians. The distribution of minute beads seems to be quite general throughout the southwest area with the greatest concentration being reached in the southern and western parts. Their presence in large quantities in pueblo ruins of the Reserve district suggests that this region was a part of the concentrated area. Several varieties of beads were manufactured: (a) Stone and clay beads of disc-shape with centrally located perforations, (b) Disc and irregular-shaped beads of shell, all centrally perforated, (c) Olivella shell beads with natural perforations, (d) Small Conus shell tinklers with perforations at base, and (e) Figure "8" beads made from Glycymeris shell with perforations, for suspension, drilled through the upper and smaller parts.

Five necklaces consisting of minute disc-shape beads were found in the pueblo horizon. Each was found with a burial and under such conditions as to indicate it had adorned the individual in life and not placed in the grave as a mortuary offering. The total number of beads in these necklaces number more than 8400, yet their combined lengths is but 275 inches, making an average of more than 30 beads to the inch. These beads vary in size from slightly less than $1/16$ of an inch to $1/4$ of an inch in outside diameter, and the walls are extremely thin. The central perforations range from $1/32$ of an inch to $1/16$ of an inch in diameter. The smaller diameters are confined to the slate-colored and red stone beads—those of shell have maximum diameters. The perforations in the shell beads, being of maximum size, allowed the insertion within that space of the smaller stone and clay beads. One necklace rested in the earth in such fashion as to suggest alternate spacing of shell beads enclosing smaller ones of black stone, and shell beads enclosing those of red stone. Another strand consisted of 1120 disc shell beads, interspaced by 273 smaller stone and clay beads. Still a third consisted of 1600 stone and clay beads and 110 interspaced beads of shell. The small red and slaty-colored beads are, according to Bryan,⁷⁷ made from clays probably related to the minerals halloysite and beidellite. They frequently carry a gloss, probably from contact with the oil of the human skin.

77. In Cosgrove, 1932. P. 64.

The simplest form of bead used for personal adornment was that made from *Olivella* shell. All that was necessary to prepare them for suspension was the grinding down of one end, for the perforation is a natural feature of the shell. Beads of this type occur in large numbers, particularly with burials, in Basketmaker and Pueblo I deposits. A few isolated beads and fragments were found in houses of the San Francisco Phase at Starkweather, but the only complete strands recovered were in connection with burials of the pueblo horizon. One burial indicated that the person had worn a necklace of over 250 such beads (Plate 49f). Another very fine strand of 30 *Olivella* beads included in addition 12 *Conus* shell tinklers (Pl. 49,b.). This seemed to have been worn with the shell tinklers forming the central part of the necklace and the *Olivella* shells the distal ends. This was shown by their position on the skeleton with which they were found. Cosgrove found *Conus* shells of this type with late burials in the Mimbres.⁷⁸

One very interesting group of beads came from the pueblo horizon. The beads are cut in the shape of a figure "8" and are perforated for suspension (Pl. 50a). They were found with a pueblo burial, and their position and number indicate that they had formed a bracelet. Each figure "8" bead was separated by one or two minute disc-shaped stone beads of red color. Figure "8" beads were made from sections of *Glycymeris* shell, and are a late pueblo development. They do not occur in the pithouses at Starkweather nor in the early horizons in areas to the north and south. Roberts⁷⁹ found them in the pueblo horizon at Kiatuthlanna, and they have been reported from the classic ruins of the Chaco canyon and the Mimbres Valley.⁸⁰

Turquoise beads and pendants (Pl. 50e,f.) were not numerous at Starkweather and were confined to the pueblo horizon. The beads are irregular-shaped and have central perforations. They vary considerably in size and thickness, from slightly less than $\frac{1}{8}$ of an inch to $\frac{3}{8}$ of an inch in diameter and $\frac{1}{16}$ of an inch to $\frac{1}{4}$ of an inch in thickness. There are four pendants in the collection measuring $\frac{3}{8}$ of an inch to $\frac{5}{8}$ of an inch in length and of varying widths. The pendants were well-smoothed and polished and were probably used as ear-bobs as they are usually found on either side of the skull. The nearest source of turquoise was in the Burro Mountains, about 100 miles south of the ruin.

78. Cosgrove, 1932.

79. Roberts, 1931.

80. Nesbitt, 1931.

GENERAL SUMMARY

The Starkweather ruin is located on the Hudson ranch property near the town of Reserve in Catron county, New Mexico. Excavations were conducted here during the summers of 1935 and 1936. At the close of the 1936 season the remains of 18 pithouses and a pueblo ruin, comprising 12 rooms, had been uncovered. Evidences were that the pithouses represented three different phases of the Mogollon culture: Georgetown, San Francisco and Three Circle, and that they were built in the order named. Stratigraphic evidence and pottery types clearly demonstrated that the pueblo was built subsequent to any of the pit structures.

There were four kinds of pithouses. Type I consisted of round domestic structures with lateral entrances; Type II, round domestic pithouses with roof entrances; Type III, rectangular domestic pithouses with lateral entryways and Type IV comprised a round ceremonial pithouse with stepped entrance. Type I is believed to be the earliest structure and to be characteristic of the Georgetown phase. Types II, III, and IV are later developments and correlate with the San Francisco and Three Circle phases. The superstructure erected over the pit varied with the house type. That supported by four upright corner posts was the most prevalent and appeared in houses of all types, except IV, in which no evidence of supports was found. The four post supports held up a rectangular framework upon which rested the cross poles to form the flat roof, and the side poles to form the upper walls. In houses of Type III the superstructure was more frequently supported by a central post with smaller supports arranged along the long axis of the room. Such an arrangement suggests a low gable-type of roof.

Interior furnishings in the pit dwellings were meager and showed little variation from period to period. All houses had cache-pits and, with the exception of Type II houses, lateral entrance ways. Type II houses were without this feature and showed ladder pits near the center of the floor. In such houses an opening in the center of the flat portion of the roof served both as a smoke hole and an entrance. Firepits were present in Type III houses but absent in all others. The ventilator-deflector-sipapu complex, so characteristic of northern Pueblo I dwellings, was not present although it does occur in rooms of the pueblo structure. In this latest phase at Starkweather they seem to represent a survival of early northern culture developments.

The circular houses with roof entrance were found to be reminiscent of structures belonging to the end of Basketmaker III and not unlike the small pithouses uncovered by Roberts at Kiatuthlanna. The rectangular and

circular houses with side entrances have some features in common with late Basketmaker houses, particularly in form, depth of pit, and presence of side passage. Significant differences exist, however, in the absence of upright stone slabs in the walls, antechambers, sipapu, deflector, and ventilator. In several of the Starkweather pithouses the side passages were exceedingly narrow which indicated that entrance may have been through the roof and the reduced side-passage used as a ventilator. All rooms, with the exception of Type II, were in most respects like those uncovered by Haury at the Mogollon and Harris sites. The variation in house types at Starkweather indicates that there was considerable instability during the period of occupancy. In general such fluctuations in house types is characteristic of the early pueblo horizon. The dated wood (927 A.D.) from houses of San Francisco age places many of the houses as being contemporaneous with this period and there are no conclusive evidences to warrant the placing of the Georgetown houses in a still earlier period than Pueblo I.

The pueblo ruin was found to have been a single-story structure consisting of twelve rooms having stone and adobe walls. The pueblo had not been erected as a complete unit, but had grown from an original rectangular structure of seven rooms. From time to time new rooms to the total of five had been added. Although these rooms represent distinct stages in growth, the additions and changes all seem to have taken place within a relatively short period of time. In general all twelve rooms conform to the same architectural style, being constructed of coursed stone and built up primarily by a dry stone technic. Wall plaster was not used on either the inside or outside. Entrance was by a hatchway in the roof and intraroom doorways existed only between domestic domiciles and storerooms. Floor features were more elaborate than in the pitrooms and comprised fire-hearths, ventilators, deflectors, cache-pits, and occasional secondary features in the form of sub-floor burials and mortuary offerings. Throughout its various stages the pueblo seems to have been much like those of the Little Colorado area. The circular kiva is, however, absent and in its place is found a rectangular ceremonial room with only a part of the northern kiva-complex features being present.

There are evidences then of a distinct hiatus between the pithouses and the pueblo structure. The differences in architecture, pottery, and other objects of material culture are too marked to warrant the belief that the pioneer settlers ceased building pithouses and adopted surface dwellings. The indications are that the pit-dwellers abandoned the site prior to 1000 A. D. and that it was reoccupied at a later date by pueblo groups pushing southward from the Little Colorado area. What brought about the

abandonment of the pithouses could not be ascertained. All that can be said is that they were occupied during the greater part of Pueblo I period and possibly during the early stages of Pueblo II. Then occupation at Starkweather ceased until the pueblo structure was built in Pueblo III. During the greater part of Pueblo II Starkweather village was not occupied.

The skeletal remains reveal rather marked contrasts in physical types between the pitroom and pueblo horizons. The series is, unfortunately, small. The crania from the pithouses reveal two types: a mesocephalic, narrow-faced type with moderate deformation and a mesocephalic, broad-faced, undeformed type. The physical features suggest a mixing of both stocks and customs. Although both are suggestive of the Basketmaker physical type, one gives evidence of Pueblo infiltration and the adoption of the cradleboard which produced head flattening. Neither of the crania conforms closely to the Wichita and Caddo series which Woodbury used in showing the racial affiliations of the Mogollon village skull.

The crania from the pueblo horizon are similar to those from other Southwestern pueblo ruins and show, in particular, a close relation with the Mimbres type. All of the skulls have a pronounced occipital flattening indicating complete adoption of the cradleboard. The crania are brachycephalic and hypsicranial and would be even if corrected for deformation. The nose is high mesorrhine bordering on low platyrrhine and the facial width is slightly below the Indian average.

Disposal of the dead throughout all periods was by inhumation. The pithouse peoples made some subfloor and some outside burials with the bodies being placed in positions of extended and flexed. There was no apparent uniformity in the placement of the arms. Graves were circular or rectangular pits and mortuary offerings were either entirely absent or meager. In contrast to this the Pueblo peoples interred the dead in an out-lying burial ground east of the dwelling. Bodies were placed in positions of extended, semi-flexed, and flexed and were accompanied by a wealth of mortuary offerings. Intra-mural burials occurred though less frequently. No thought had been given to the orientation of bodies.

The bulk of the lesser objects of material culture consisted of imperishable materials and comprised pottery containers, stone and bone implements, carved and uncarved stone slabs, and objects of personal adornment made from stone, shell, and clay. Certain classes of this material show marked differences between the pithouse and pueblo horizons, others are much the same throughout all phases. The most marked changes were in pottery. The ceramic types of the pithouse horizon are distinctive and

show but few similarities to northern types of the same age. The pottery as a whole is identical to that reported by Haury from the Mogollon and Harris village sites, and because of its distinctiveness can be designated as constituting a special group whose affiliations are not yet entirely clear. Only further investigations over a larger area can determine if these ceramic types are native to the southern region or due to intrusions from outside the Southwest area. At Starkweather there is a marked hiatus between this pottery and that of the pueblo horizon. The latter displays a distinct northern influence particularly from the Little Colorado area. In the painted ware this is so strong as to indicate that the Upper Gila painted pottery represents only an extension of the Little Colorado area and that as a ceramic culture the Upper Gila region has only plain and corrugated wares to distinguish it.

The bone and stone implements show both northern and southern influences, the latter coming in Pueblo III times. The shell objects are primarily confined to the pueblo horizon and show traits that are southern and western. Except for pottery the pithouse or Mogollon horizon correlates closely with Pueblo I culture, while the pueblo objects of material culture are typically Pueblo III.

Taken as a whole the pitroom culture shows many similarities to Basketmaker III and Pueblo I remains. The economy of the two groups appears to have been about the same, the physical types of both show admixture, and there are parallels in stone and bone objects, pottery forms and designs, burial methods and architecture. There are, on the other hand, some significant differences in pottery which bar more complete equation of the patterns. Some of the ceramic features correlate with the Hohokam wares, particularly in color, and some show likenesses to certain eastern and southern wares. As to how much of this is due to superficial resemblances and how much to actual identities is expressed more fully in the section following.

SECTION II.

Affiliative Aspects of the Mogollon Culture

CHAPTER VII

AFFILIATIVE ASPECTS OF THE MOGOLLON CULTURE

The essential facts regarding the character of the Mogollon culture in the Reserve section of New Mexico and its relation to similar remains near Glenwood, New Mexico and in the Mimbres valley have now been given. Throughout, references have been made to the distinctive character of numerous material traits which cannot be matched in either the Basketmaker-Pueblo or the Hohokam patterns. On the other hand, attention was drawn to the similarity of many culture traits to these broader culture patterns. Thus there is raised the problem* of the relationship or the affiliative aspects of the Mogollon culture.

At the present time there is recognized two major culture patterns in the Southwest, the Basketmaker-Pueblo in the north and the Hohokam in the south. Both of these complexes are well-known and each has contributed significantly to the development of southwestern cultures. Where does the Mogollon belong with regard to these basic and widespread complexes? This problem resolves itself into several possibilities:

- a. The Mogollon culture is a variant of the Basketmaker-Pueblo.
- b. The Mogollon culture is a variant of the Hohokam.
- c. The Mogollon culture has been shaped by both Basketmaker-Pueblo and Hohokam influences.
- d. The Mogollon culture represents an entirely new basic pattern.

In his publication on the Mogollon and Harris villages, Haury⁸¹ outlined certain likenesses that exist between the Mogollon culture and the Basketmaker-Pueblo and Hohokam. He also hinted that certain specific racial and cultural relationships existed with Caddoan horizons in the Mississippi valley. This and other evidences were judged sufficient to warrant the recognition of a Proto-Caddoan root from which stemmed the Mogollon and Caddoan cultures.

With the addition of data from Starkweather ruin, plus the findings at Snaketown ruin, a more complete picture of the Mogollon is now known and affiliations and relationships can be more accurately weighed. In the treatment of this problem I have not confined myself to the cultures of the Southwest but have included within the affiliative scope certain Caddoan remains of Texas, Arkansas and Nebraska. Certain affiliations, particularly those with the Caddoan, were difficult to evaluate, as culture horizons comparable in age to the Mogollon are not currently known. I have tried to

* As indicated in introduction.
81. Haury, 1936.

consider all aspects of the Mogollon culture, pottery, minor artifacts, architecture and physical type and the conclusions at which I have arrived are in view of the total culture pattern and not single trait-complexes such as pottery.

My findings on the Mogollon culture affiliations will be presented in three parts:

- a. Architecture.
- b. Ceramics.
- c. Minor artifacts, comprising objects of stone, bone, clay and shell.

The affiliations of the physical type and the conclusions drawn from that evidence have already been treated (pages 71-77) and need not be repeated here.

Architectural Affiliations

In both the Upper Gila and Mimbres areas an architectural sequence for the Mogollon culture has been established primarily by stratigraphy and ceramic types, as tree-ring data was obtainable from only four houses in Haury's Mogollon village⁸² and one house in the Starkweather ruin. Other criteria, which were employed, are house form, support arrangement, character of entrance, presence or absence of masonry, firepits and plaster.

The architectural sequence at Starkweather does not follow exactly that obtained by Haury in the Mimbres valley.⁸³ The Georgetown houses agree perfectly but their survival into the later San Francisco phase at Starkweather has no parallel in the Mimbres. Also small round pithouses with roof entrance appear along with the rectangular form with lateral entry in the San Francisco phase. This house type was not present in the Mogollon sites excavated by Haury but this may possibly be due to inadequate excavation in discovering all of the variations.* In general the Starkweather pithouses are considerably more irregular in form and are less homogeneous in architectural details than are the Mogollon and Harris village houses.

Passing to a comparative study of the architecture, this portion of the paper will be concerned with an analysis of the house features. Turning to the Hohokam area to the southwest one encounters ruins of the Colonial period, which are, in the main, contemporaneous with those of the Mogollon (San Francisco phase.) Parallel features are to be found in the rectangular form, lateral entrance, shallow excavation, and the gable-type roof. The Colonial Hohokam houses differ in having stone-supports for wood

82. Haury, 1936; Nesbitt, This report, pages 86-93.

83. Haury, 1936.

* Correspondence with Haury.

flooring, prevalence of stepped entrance rather than the inclined type, and floor grooving. Evidences of contact with the Hohokam is not indicated in the ceramics at Starkweather but at the Hohokam ruin of Snaketown, Mogollon intrusives were found in all phases of the Pioneer period.⁸⁴ In the absence of other Mogollon traits at Snaketown this may be interpreted as indicating that both people received their early wares from a common source, and if Gladwin's⁸⁵ dates for the basic Pioneer are correct the Snake-town peoples received it considerably earlier than did the Mogollon in western New Mexico.

The Georgetown phase house of the Mogollon which is characterized by circular form, deep pit, and inclined entry has no contemporary parallel in the Hohokam. In fact Haury, Gladwin, and Sayles have found that the Hohokam houses developed in an opposite direction,⁸⁶ that is, from rectangular to circular form. It is significant, however, that the circular pit-house survived at Starkweather until late in the San Francisco phase. The finding of Mogollon pottery in Colonial horizons of the Hohokam infers that there was some contact between the regions under consideration. Did, then, the architectural impetus come from the Hohokam or did it reach the Hohokam from the Mogollon? I am inclined to believe, considering the evidences at hand, that the San Francisco rectangular pithouse is not a distinctive type at all but an intrusive form of the Roosevelt 9:6 Colonial.⁸⁷ It does not appear reasonable to have the shift from the Georgetown house to the San Francisco taking place so abruptly. As I have pointed out elsewhere* there is little to warrant a long Georgetown period and I am inclined to believe that it might be the brief beginnings of the San Francisco that was somewhat beclouded by a Colonial house type coming in.

Concerning architectural affiliations with the Basketmaker-Pueblo cultures to the north, it is believed, with substantiating tree-ring data, that the San Francisco phase of the Mogollon complex is contemporaneous with Pueblo I. Pueblo I is generally believed to cover about 200 years, from 700 to 900 A.D. The tree-ring data obtained by Haury⁸⁸ and that recovered at the Starkweather ruin show dates ranging between 898 - 927 A.D. for the San Francisco phase. It is impossible to state just where in the phase they belong, whether early or late, but from certain evidences, particularly ceramic, it is probably late. No wood dates are known for houses which are earlier in the phase nor do we have any absolute dates for the round

84. Gladwin, Haury, Sayles and Gladwin, 1937.

85. Gladwin, 1937.

86. Haury, 1932; Gladwin, Haury, Sayles and Gladwin, 1937.

87. Haury, 1932.

* Page 91 ff.

88. Haury, 1936.

pithouses classified as Georgetown. The appearance of the Mogollon sites excavated so far give no impression of permanence. Stratified rooms are not common and pottery, judging from the number of whole pieces and sherds, was not abundant. Except for pottery there are but few minor differences in the material culture between the three phases, and the rarity of Mogollon burials infers that the period of occupancy was not particularly long. There is no evidence to support the belief that lack of burials may be due to the practice of cremation. I am inclined to believe that the houses of the Georgetown phase are no more than two centuries older than those of the San Francisco phase for which we have dates. The dates of 700 - 800 A.D. would then mark the beginnings of the Georgetown phase in the Upper Gila and Mimbres areas, and this range of time is broadly contemporaneous with the beginnings of Pueblo I. If the Mogollon possesses northern affiliations they should, then, be correlated with Basketmaker III - Pueblo I developments.

Turning to the north in eastern Arizona we encounter at Kiatuthlanna a Pueblo I ruin excavated by Roberts.⁸⁹ It is his belief that Kiatuthlanna is basically a Chaco pattern and that there appears to be a definite lag of from 50 to 75 years between the Chaco and the Kiatuthlanna district.* The Mogollon had no marked influence at Kiatuthlanna which ordinarily would be expected if Haury's and Gladwin's⁹⁰ postulated dates for the Georgetown are valid. The Kiatuthlanna series of 18 pithouses are broadly contemporaneous with the San Francisco phase of the Mogollon, and possibly with those of the late Georgetown. The Kiatuthlanna houses were of two types: one consisted of a circular or oval pit with vertical walls and a four-post support plan; the other had a larger oval or circular pit, a four-post support plan and an encircling bench as an upper wall feature. The small houses are believed to have been the earlier form and the larger the ultimate development. Both house types possessed roof entrances, ventilators and deflectors.

Some of these northern pithouse features are present in early Mogollon houses to the extent that they cannot be considered the result of sheer coincidence. Architecturally Roberts' earliest house type is basically similar to the Type II houses of Starkweather. Only the absence of ventilator and deflector in the latter prevents complete identity. Roberts' ultimate Kiatuthlanna pithouse has close parallels in several of the Mogollon circular houses. House No. I is similar in having a circular form and a four-

89. Roberts, 1931.

* Correspondence with Roberts.

90. Haury, 1936, Gladwin, 1937.

post support plan. House No. Q at Starkweather and House No. 2 at Mogollon village likewise reveal significant northern features. In the former house, which is of Georgetown age, a bench encircles the upper wall and a four-post support plan was used. Haury's house No. 2, of San Francisco age, revealed benches along two sides. Earlier it was pointed out that many of the side openings classified as entrances may, after all, be ventilator features and this would suggest an even more complete equation with the north.

As we go farther afield in the northern area we find that Basketmaker III and Pueblo I ruins confirm many of the above affiliations. The late Basketmaker Shabik'eschee village in the Chaco canyon⁹¹ and the ruins between the Mancos and La Plata in southern Colorado⁹² show pithouses circular in form and with both side and roof entrance. In their basic features they compare favorably with the circular pithouses of the Georgetown phase. Certain differences do exist, however, particularly in the slab masonry and the deflector-sipapu complex which have no parallels in the Georgetown houses at Starkweather. These similarities to the northern pattern either infer some culture connection between the Mogollon and Basketmaker-Pueblo or indicate that both were subject to the same architectural influences. Particularly significant is the peripheral nature of the Mogollon with reference to the centers of high development in the north and the great likelihood of a definite time lag. I should say, from the evidences at hand, that the basic Mogollon house type as represented at Starkweather is due to radiation from the northern Basketmaker-Pueblo and that the rather sudden shift to the rectangular house of the San Francisco was produced by an intrusive form of the Colonial Hohokam coming in.

Focusing attention on districts outside of the Southwest area the similarity of the Mogollon houses to certain eastern forms seems undeniable. Similarities exist with Nebraska pithouses of the Sterns Creek phase and the later Pawnee earth lodge. The validity, on the other hand, of comparing culture horizons whose historical dates are unknown is questionable. The dates for Nebraska pithouses are only relative and we possess no convincing evidence that they are contemporaneous with the Mogollon culture. Strong's⁹³ Proto-historic earth lodge is both circular and rectangular in form, possesses a side entrance, deep pit, and has a four-post support plan. These similarities may be only superficial, for marked differences from the

91. Roberts, 1929.

92. Morris, 1919.

93. Strong, 1935.

Mogollon pithouse pattern do exist. Significant is the difference in size, the Nebraska houses frequently attaining diameters ranging between thirty and forty feet and accompanied by side entrances of almost equal length. The four primary support posts are located near the center of the room and not at the periphery as in the Mogollon houses. A large series of posts surround the room periphery and the walls consist of wattle-work, features not seen in the Mogollon houses.

The later Pawnee earth lodge described by Wedel⁹⁴ represents a subsequent localized variation of an architectural idea that is at the root of this house type. The floor plans of these houses show a shallow excavation which is circular in form, the use of four and six support posts located near the center of the room, and a long, sloping side entrance.

Harrington's excavations in Arkansas reveal the grouping of medium to small rectangular pithouses into small villages.⁹⁵ Similarities to the Mogollon house types are to be found in the four-post support plan, rectangular and occasionally circular form, and inclined entrance.

For the intervening area between the Southwest and the Mississippi valley we have practically no data. For Texas there is no data on pithouses although it is generally believed that the Arkansas type occurs there.

Any similarity of the Mogollon houses to eastern forms is very general and no implication of affiliation can be made on characters other than those of form and entrance. Considering the widespread geographical distribution of the pithouse structure and the presence of certain basic similarities in all houses, regardless of location, I am inclined to believe that we have a general pithouse pattern that is widely scattered in North America and which, ultimately, is derived from the Old World.

Ceramic Affiliations

The following pottery types have been identified for the Mogollon culture: San Lorenzo red-on-brown, Mogollon red-on-brown, Three Circle red-on-white, San Francisco red, Alma plain, Alma scored, Alma punched, Alma incised, and Alma neck-banded. In determining the affiliations of these ceramic types I will compare their morphological features with those of the Basketmaker-Pueblo, the Hohokam, and cultures falling outside of the Southwest area.

The Basketmaker-Pueblo ceramics offer several elementary similarities with the Mogollon. The two pottery cultures contain identical techniques of manufacture, the coil method, and there are similarities in temper-

⁹⁴ Wedel, 1936.

⁹⁵ Harrington, 1920.

ing, vessel forms, and design motifs. The design elements on Mogollon red-on-brown suggest strongly a Basketmaker-Pueblo influence for there appears to be a development of that type of design out of the older more open Basketmaker III form in the north. On the other hand designs of this type are so widespread that perhaps they cannot be definitely attributed to any one section. There is a marked difference in color between the Mogollon and Basketmaker-Pueblo pottery. The Mogollon is distinctive in its employment of reds and browns, the Basketmaker-Pueblo in its combinations of black and white. Nor do the textured wares of the Mogollon find decorative parallels in the north. These color differences must not be regarded as rigid in setting off the ceramics in question. Guernsey⁹⁶ found Red ware, not unlike the San Francisco, in Basketmaker III and all Pueblo I deposits of northeastern Arizona and Morris,⁹⁷ treating with the ruins of southern Colorado, speaks of "shades of brown in vessels" and mentions the presence of red bowls. Roberts' Colorado material includes a pottery type that is analogous to Alma neck-banded and his smooth-faced Basketmaker III culinary vessels compare well with Alma plain.⁹⁸

What case does this evidence present? It is apparent that, basically, the two patterns have pottery which is in general accord except for the preponderance of reds and browns and the absence of blacks and white in the Mogollon. The Mogollon people seem to have entered southwestern New Mexico with a certain type of pottery, one which was undecorated but red to brown in color. Here they came into contact with influences radiating from the north and as a result developed typical Southwestern vessel forms and design motifs. Houses of the Georgetown phase are without painted pottery but the San Francisco red ware and the Plain both reveal color tones, ranging from brown to red and these were carried over into the subsequent period, the San Francisco, where painted pottery first appears.

Turning to the west and south we find that the Hohokam presents several perplexing problems to the clear understanding of the ultimate origin of Mogollon pottery. At the Hohokam ruin of Snaketown in Arizona a polished red ware, like San Francisco red, appears in all horizons of the Pioneer period from Vahki to Snaketown.⁹⁹ Nora Gladwin,¹⁰⁰ by petrographic analysis of pottery, has determined that the polished red wares from Snaketown and Mogollon are indistinguishable. But these sherds at

96. Guernsey, 1931.

97. Morris, 1919.

98. Roberts, 1930.

99. Gladwin, Haury, Sayles and Gladwin, 1937.

100. Gladwin, Nora in Gladwin, Haury, Sayles, and Gladwin, 1937.

Snaketown are intrusive and unlike all other native (Hohokam) pottery and suggest diffusion from an outside source. Since Basketmaker intrusives go back only to the Gila Butte phase of the Hohokam it is the assumption of both Haury and Gladwin that the Mogollon ceramic complex was a going concern long before the beginning of pottery making in the San Juan area.¹⁰¹ Also because the Mogollon intrusives are technically superior to anything made by the Hohokam it is inferred that the Mogollon complex is the oldest in the Southwest. If Gladwin's postulated date of 300 B.C. for the Vahki phase of the Pioneer is correct it would mean that the desert dwellers received polished red pottery long before the Mogollon peoples of southwestern New Mexico did. The implications seem clear that the Hohokam and the Mogollon derived certain ceramic types from the same source, a source which has to date not been identified. Turning to the native wares of the Hohokam it is found that they offer little similarity to those of the Mogollon. Technics of manufacture are different, the Hohokam employing the paddle and anvil, and the Mogollon the coiled technique. Vessel forms and design motifs are also at variance. In color a marked likeness exists in the red-on-buff wares of the Hohokam. Although Haury¹⁰² considers this likeness to be superficial, Mogollon red-on-brown is, on the basis of color, more closely related to the Hohokam red-on-buff than to any other ware currently known in the Southwest. My feeling is that the San Francisco painted wares of the Reserve area are the result of color influences coming from the same source as that which shaped the Hohokam, and that the vessel shapes and design motifs owe their origin to influences from the Basketmaker-Pueblo. Beyond these suggestions of relationship we cannot at the present time go.

Over-stepping the boundaries of the Southwest area and looking toward the pottery wares of the east, what case do the wares of Texas and the Mississippi valley present? Do we have any place in this vast region a basic culture from whence may have been derived the early ceramics of the Mogollon and Hohokam? A digest of the available references on this region establishes ground for comparison. It should be emphasized, however, that in the absence of a more absolute chronology, no valid comparison of time periods can be made. In general, and so far as we now know, the Mississippi wares* are much later than those of the Mogollon. Comparing the regional wares there is the same general tendency toward a red-on-brown

101. Gladwin, 1937

102. Haury, 1936.

* This term includes pottery of the Middle Mississippi area, Nebraska and Arkansas. Different culture horizons are thus thrown together in a single classification, but the general cast of the traits can be distinguished.

color scheme. This is particularly true of the Red River Caddo, Hasinai, and Wichita of Texas where Sayles¹⁰³ found gray, buff, brown and red wares both slipped and unslipped. For the Arkansas region, Harrington¹⁰⁴ reported the absence of painted pottery, and Strong¹⁰⁵ mentions none for Nebraska. Other Mogollon tendencies are to be found in various textured technics comprising punched, trailed, scored and incised. Indented designs are typical of the Red River region of Texas¹⁰⁶ and seem also to center in Arkansas.¹⁰⁷ However, the technic is different from that of the Mogollon in that the designs were engraved in the pottery after the vessel had been fired and polished rather than before. In the east there followed also the rubbing of red and white paint into the incisions. The design elements are also non-Mogollon and consist of meanders, concentric circles, and triangles. Holmes¹⁰⁸ mentions a vase from Arkansas which has a winged-serpent design engraved on the side, nothing comparable to this is found in the Mogollon. Cord-marking, a non-Mogollon feature, was common in Strong's Sterns Creek and Upper Republican cultures of Nebraska,¹⁰⁹ while true incised technic was found only on the rims of bowls and the upper portions of larger vessels. Certain superficial resemblances are to be found between the smooth and grass marked pottery of Signal Butte and the Alma Scored type of the Mogollon. Vessel forms show both similarities and differences. In Arkansas¹¹⁰ the bowl is the predominant type and corresponds to the Mogollon, as do the olla forms of Nebraska. In both Texas and Arkansas, on the other hand, eccentric forms comprise a large class. These include human and animal effigy jugs and vases, odd-lobed and compound forms, and eccentric bowls. None of these features are found in the Mogollon. Mineral tempering which is characteristic of most Mogollon pottery has a parallel in certain wares of western Arkansas and eastern Texas, while pottery of the Upper Republican in Nebraska is without exception tempered with gravel or crushed stone.¹¹¹ This ceramic comparison with certain eastern wares suggests that basically similar technics are widespread but expressed differently. Particularly is this true of the red and buff color scheme. The design motifs of the Mogollon, on the other hand, are clearly Southwestern. While there are similarities in vessel forms these are greatly offset by the differences.

103. Sayles, 1935.

104. Harrington, 1920.

105. Strong, 1935.

106. Sayles, 1935.

107. Harrington, 1920.

108. Holmes, 1899.

109. Strong, 1935.

110. Harrington, 1920.

111. Strong, 1935.

I am inclined to place little stock in the similarities between the Mogollon and the Caddoan groups of the east. Those existing are so slight as to border on coincidence and not the result of any culture contact. It is quite possible, although at present there is little evidence to substantiate it, that both the Mogollon and Caddoan wares are early offshoots of a basic pottery and eventually with their spread in opposite directions and through time, isolation, and being subject to different influences have come to be expressed differently. If there be any truth in this assumption the farther back in time we go the more closely related should be the Caddoan and Mogollon wares. It is significant that the Georgetown pottery bears a closer resemblance to the Caddoan than does the later San Francisco pottery. Particularly needed is data from sites, contemporary with Mogollon, in Nebraska, Arkansas and Texas. But as the evidence now stands it appears that the painted wares of the Mogollon are a Southwestern development, evolved by a distinctive color combination plus vessel forms and design elements borrowed from the northern Basketmaker-Pueblo.

Affiliations of Minor Artifacts

This discussion will be concerned with a description and analysis of Mogollon artifacts comprising the following classes: Manos and metates, Mauls and axes, Pipes, Chipped stone and Miscellaneous objects. This will be followed by a comparison with the Basketmaker-Pueblo, Hohokam, and eastern cultures falling outside the Southwest area.

Manos and Metates:

Mogollon metates are troughed and closed at one end, the oldest being an oval-basin milling type. Later specimens, those of the San Francisco and Three Circle phases, had grinding surfaces with parallel sides. This type is the direct ancestor to the open-ended rectangular metate of the Classic Upper Gila and Mimbres. A single oval bowl metate may also belong to the early Mogollon.

Comparing with the Basketmaker III and Pueblo I-II it is found that these cultures also have the open-end trough metate and it is identical to the Mogollon. Looking for analogies in the Hohokam we find that here the metate shows close similarities in form, size and grinding axis with the Mogollon type. It differs only in being frequently open at both ends. The single oval bowl metate from Starkweather has a companion in the fragmentary mortar from Roosevelt 9:6, a Colonial site.¹¹² Leaving the Southwest and going eastward it is found that similar milling types are found in Texas¹¹³ and in Nebraska.¹¹⁴ Mogollon type metates have, then, a wide

112. Haury, 1932.

113. Sayles, 1935.

114. Strong, 1935.

geographical distribution extending from Flagstaff east to the Plains region, and in horizons from Basketmaker III to Pueblo II.

Manos of the Georgetown and San Francisco phases were rounded, occasionally elliptical, and with complex grinding surfaces. Similar and identical forms come from Basketmaker, Pueblo and Hohokam horizons. The Texas cultures, Red River Caddo, Hasinai, and Wichita have oval-shaped milling manos which are frequently pitted. The Nebraska Sterns Creek mano is of a similar type.

There is nothing distinctive, then, about the Mogollon metate and mano. Both have a wide geographical distribution within and outside the Southwestern area.

Mauls and Axes

Mogollon mauls are of two types, full-grooved and three-quarter grooved. Both are present in the San Francisco and Three Circle phases. Ultimately, in the pueblo horizon, the three-quarter grooved form replaces almost completely the full-grooved. Axes, first met with in the San Francisco horizon, are the full-grooved, short-bitted type, the elongated three-quarter grooved form not appearing until late Three Circle and early Pueblo.

The full-grooved maul is identical to that found in Basketmaker III and Pueblo I deposits in the San Juan area.¹¹⁵ No mention of mauls is made for the eastern cultures but pitted and discoidal hammerstones are present.

The short-bitted, full-grooved axe is the same type as that found in northern Basketmaker III and Pueblo I horizons. The Pueblo I type, illustrated by Roberts, from Kiatuthlanna¹¹⁶ is identical and Morris¹¹⁷ describes like forms from the San Juan.

Hohokam axes show a marked difference, being the long-bitted, three-quarter grooved type. They appear in the pueblo horizons of southwestern New Mexico as a Hohokam importation but are not found in the earlier Mogollon.

Turning to the east we find that Texas has full-grooved polished axes in all phases.¹¹⁸ Although in general these axes conform to the Mogollon pattern, closer analysis reveals a number of differences. These comprise frequent appearance of double-bitted forms, sinuous cutting edge, and

115. Morris, 1919; Kidder and Guernsey, 1919; Guernsey, 1931; Roberts, 1929.

116. Roberts, 1931.

117. Morris, 1919.

118. Sayles, 1935.

longer bit. Axes appear in the Nebraska cultures,¹¹⁹ but are made primarily by chipping and not by the pecking-grinding-polishing technic of the Mogollon. They are also companion to polished and unpolished celts, neither of which occurs in the Mogollon. Harrington¹²⁰ states that in Arkansas celts were abundant and axes rare.

The Mogollon axe appears, then, to be closely related to the Basketmaker III - Pueblo I type and has only superficial resemblances with those found in the eastern cultures.

Pipes:

In the Mogollon pipes were made from stone and comprised a single type, the tubular cloud-blower. They are known from the San Francisco and later phases.

Similar stone pipes have a wide distribution and occur frequently in northern Basketmaker and Pueblo horizons. Roberts,¹²¹ Morris,¹²² and Guernsey¹²³ illustrate forms that are identical. At no time did the peoples of the Hohokam employ pipes.

In general the pipes found to the east in Texas, Arkansas and Nebraska show but few similarities to the Mogollon type. For Arkansas, Harrington¹²⁴ reports long-stemmed earthen pipes which are often painted, short - stemmed forms and effigy pipes. For the Republican culture of Nebraska, Strong¹²⁵ describes both clay and stone elbow pipes. Clay elbow pipes are common in the Hasinai of Texas.¹²⁶

These facts indicate that Mogollon pipes are more closely related to those of the Basketmaker-Pueblo pattern than they are to the prevailing eastern types.

Chipped Implements:

Mogollon chipped implements comprise several types of tools: projectile points, knives, drills and scrapers.

In general, the stone work of the Mogollon, Basketmaker and Hohokam were on about the same level. Each used chipping for objects that are similar in type. Projectile points are less common in the Hohokam than in the Mogollon and a few differences are to be noted, namely the presence of slender, shouldered and barbed points, points with multiple barbs along the

119. Strong, 1935.

120. Harrington, 1920.

121. Roberts, 1929, 1931.

122. Morris, 1919.

123. Guernsey, 1931.

124. Harrington, 1920.

125. Strong, 1935.

126. Sayles, 1935.

sides, and serrated edges.¹²⁷ Scrapers and drills of the Mogollon, Hohokam, and Pueblo show many parallels and no clear distinctions can be made. End, side, and disc scrapers are present.

Turning to the eastern regions it is found that the Mogollon chipped implements bear many resemblances to the hunting weapons of the Plains. The deep-notched, expanding-stem points of the Georgetown and San Francisco phases find a compliment in the Signal Butte II horizon of western Nebraska, and a somewhat similar type is reported from late Caddo burials in Louisiana.¹²⁸ In Texas and in Arkansas are found large stemmed blades similar to those of the Mogollon. Here they occur with remains of the Red River Caddo, Hasinai, and Wichita.¹²⁹

Although there are some similarities in scrapers, the Mogollon does not possess the typical thumb-nail end scraper which is so abundant in the Plains region.

These facts suggest that there is nothing very distinctive about the Mogollon chipped implements. Parallels can be found in regions to the north and east.

Miscellaneous objects:

Mogollon features included under this heading comprise stone vessels, objects of bone, minor clay objects, and ornaments.

Stone bowls first appear in the San Francisco phase of the Mogollon and continue into the Three Circle. They are crudely finished and show considerable variation in size. Similar but more highly finished forms are found in northern Pueblo I deposits and are believed to be intrusive from the south.

The Hohokam area seems to have been an early center for stone vessels. However here the type is quite different from the Mogollon, running to carved and zoomorphic forms. It is believed that the Hohokam influenced considerably the Mimbres and it is not unlikely that the influence was also felt in the Reserve section, and in some of the peripheral Pueblo I-II villages.

For Nebraska, Strong¹³⁰ illustrates a stone dish that is a relative of the Mogollon form. Harrington¹³¹ also illustrates one from Arkansas.

Mogollon bone objects do not exhibit a great diversity in forms. The majority of the specimens are awls made from the distal ends of deer metapodials split down the middle. Awls are of two types: stubby with side

127. Haury, 1932.

128. Walker, 1935.

129. Sayles, 1935.

130. Strong, 1935

131. Harrington, 1920.

notch near base, and more elongate forms without side notch. Comparing these forms with those of the Basketmaker-Pueblo several noteworthy similarities are to be seen. The unnotched awl is widely distributed in the northern portion of the Southwest and everywhere corresponds to the same type. It is also found in the Hohokam.¹³² The notched awl is of particular interest because of its narrow distribution which is, in general, confined to the Mogollon area. Roberts, however, illustrates one from a Pueblo I pithouse at Kiatuthlanna¹³³ and Haury¹³⁴ has reported one from the Sacaton phase of the Hohokam at Snaketown. I am not at all certain that the notched awl deserves recognition as a distinctive type. The evidence is just as strong for the notch being only the remnants of the grooves and cutting used in its manufacture.

Bone awls are also an eastern trait appearing in conjunction with bone needles (non-Mogollon) in the Sterns Creek and Republican cultures of Nebraska,¹³⁵ and the Hasinai and Red River Caddo of Texas.¹³⁶ The Mogollon notched awl appears nowhere in the Southeast or Plains.

In minor clay objects a close relationship with the Basketmaker is seen in three cornucopia-shaped specimens found by Haury in houses of the San Francisco phase at the Mogollon and Harris villages. They correspond exactly with similar Basketmaker objects, but were made from clay native to the region. The trait is evidently of northern origin. No examples are known from the eastern cultures.

Quartz crystals are occasionally met with in the Mogollon and like objects appear in northern Pueblo I ruins and outside the Southwest in Texas and in Arkansas.

Shellwork appears in the San Francisco and Three Circle phases of the Mogollon. Objects of personal adornment comprise Olivella and Vermetus beads and bracelets of Glycymeris shell.

Olivella shell beads occur in large numbers, particularly with burials, to the north in Basketmaker-Pueblo horizons.¹³⁷ They also occur in all Texas cultures and probably also in Nebraska and Arkansas, although specific data is lacking. However, in Texas, Arkansas, and Nebraska there are many associated objects which are not found in the Mogollon. These

132. Haury, 1932.

133. Roberts, 1931.

134. Gladwin, Haury, Sayles, and Gladwin, 1937.

135. Strong, 1935.

136. Sayles, 1935.

137. Kidder & Guernsey, 1919; Morris, 1919; Guernsey, 1931, and Roberts, 1929.

include ear-plugs, copper ear pendants, pearl beads and gorgets. I feel that little significance can be placed upon the Three Circle shell gorget, illustrated by Haury,¹³⁸ and one, almost identical, found by Strong¹³⁹ in Nebraska.

Mogollon shell bracelets are similar to the Hohokam type whereas in the Southeast and in the Plains the majority of bracelets are made from bone.

Totaling up these facts we find that there is nothing distinctive about the Mogollon shellwork. It is merely one aspect of a shell culture that is widely distributed from the Basketmaker region south to the Hohokam and from there eastward to the Mississippi valley. In general, as one moves westward and southward the number of shell objects increases, reaching a very high development in the Hohokam where elaborate carved forms are found.

Another evidence of affiliation with the Basketmaker is suggested in the atlatl weights found in the San Francisco phase of the Mogollon. Strong¹⁴⁰ also notes the appearance of these objects in the Signal Butte II horizon in Nebraska.

Summing up, it can be said that the aggregate of minor artifacts from the Mogollon pattern have a definite Southwestern cast.* Traits that are shared with the broader Basketmaker - Pueblo pattern comprise basin shaped metates, oval and convex manos, stone pipes, chipped implements, shell ornaments, cornucopia-shaped objects, bone awls and atlatl weights. In stone, bone, and shell the Hohokam were far superior to the Mogollon and the two complexes share but few traits. Present in the Hohokam but absent in the Mogollon are the paint palette, three-quarter grooved axe, figurines, mosaic plaques and carved stone vessels. Resemblances are to be found in shell bracelets, simple stone vessels, manos, and metates. Mogollon items not found in the Hohokam comprise the full - grooved axe, stone pipes, and atlatl dart points and weights.

Certain resemblances are to be found with the cultures of Texas, Arkansas and Nebraska but they appear superficial when the associated non-Mogollon traits are included. Similarities are also limited to those traits which have an extremely wide geographical distribution.

138. Haury, 1936. Pl. 19.

139. Strong, 1935. Pl. 11.

140. Strong, 1935.

* See Table III.

TABLE III. Summary of Mogollon Culture Affiliations

Mogollon	BM-Pueblo	Hohokam	Plains*	Texas**	Arkansas
Round to oval pithouses: side entry....X		X	X	ND	X
Round pithouses with roof entrance..X		O	O	ND	O
Pottery:					
Coiled (Surface scraped and smoothed)X		O	X	X	X
Vessel formsX		O	O	O	O
DesignX		O	O	O	O
TexturedX		O	X	X	X
ColorO		X	O	X	X
MetatesX		X	O	O	O
ManosX		X	X	X	X
MaulsX		?	X	X	X
AxesX		O	O	O	O
PipesX		O	O	O	O
Chipped Implements					
ProjectileX		O	X	X	X
ScrapersX		X	O	?	?
DrillsX		X	X	X	X
Stone vesselsO		X	X	X	X
Bone implements					
Simple awlX		X	X	X	X
Notched awlX		O	O	O	O
Cornucopia objectsX		O	O	O	O
Shell ornamentsX		X	X	X	X
Atlatl weightsX		O	?	O	O
InhumationX		O	X	X	X
Semi-agricultural, hunting subsistenceX		O	X	X	X
Total similarities	21	9	12	12	13

* Sterns Creek, Signal Butte and Republican cultures of Nebraska.

** Red River Caddo, Hasinai and Wichita of Texas.

CHAPTER VIII

CONCLUSIONS

The manifestations of the Mogollon culture have now been presented in considerable detail and component parts have been compared to the better known Basketmaker-Pueblo, and Hohokam complexes, and to certain eastern cultures falling outside the Southwest area. After a thorough survey of the evidences afforded by this comparative study I am inclined to believe that the Mogollon culture, as currently known, is definitely Southwestern in character and does not represent a new basic pattern. Rather its elements are broadly similar and in many cases identical with the Basketmaker-Pueblo pattern. In addition there are evidences of infiltration of ideas from the Hohokam. In my estimation the excavations at Starkweather ruin do much to confirm the validity of this culture analogy.

The only major difference between the Mogollon and the Basketmaker-Pueblo is in ceramics. Georgetown pottery and that from the San Francisco horizon and contemporaneous with late Basketmaker III and Pueblo I, yet show no definite resemblances except in vessel forms and design elements. The red and brown color combinations of the Mogollon pottery, although not unknown in the Basketmaker - Pueblo area, are distinctive. In the north contrasting black and white colors predominate. That certain Mogollon ceramic influences penetrated the north is well established for Guernsey¹⁴¹ in Pueblo I and II ruins found red ware not unlike the San Francisco, Morris¹⁴² speaks of "shades of brown in vessels" from southern Colorado, and Robert's¹⁴³ Basketmaker III material includes types analogous to Alma plain and Alma neck-banded. It is not impossible, of course, that these traits diffused the other way, or that both regions derived certain ceramic types from the same source.

Turning to the west and the south it is found that recent work in the Hohokam area presents several perplexing problems to the clear understanding of the ultimate origin of certain Mogollon wares. At Snaketown in Arizona a polished red ware, by petrographic analysis like San Francisco red, appears in all horizons of the Pioneer period from Vahki to Snaketown.¹⁴⁴ This ware, which appears only in sherd form, is definitely intrusive and unlike all other native Hohokam pottery. Its presence suggests diffusion from an outside source. Since Basketmaker intrusives go back only to the Gila Butte phase of the Hohokam it is the assumption of

141. Guernsey, 1931.

142. Morris, 1919.

143. Roberts, 1929.

144. Gladwin, Haury, Sayles and Gladwin, 1937.

both Gladwin and Haury that the Mogollon ceramic complex was a going concern long before the beginning of pottery making in the San Juan area.¹⁴⁵ Also, because the Mogollon intrusives are technically superior to anything made by the Hohokam it is inferred that the Mogollon complex is the oldest in the Southwest. If Gladwin's assumed date of 300 B.C. for the Vahki phase is correct it would mean that the desert dwellers received polished red pottery long before the Mogollon peoples of southwestern New Mexico did. The implication seems clear then that the Hohokam, Mogollon and Basket-maker-Pueblo derived certain ceramic types from the same source, a source which has to date not been identified. My feeling is that the San Francisco painted wares of the Reserve area are the result of color influences coming from the same source as that which played upon the Hohokam, and that the vessel shapes and design motifs owe their origin to influences radiating from the north. Beyond these suggestions of ceramic relationship we cannot at the present time go.

An encouraging note on the probable origin of the Mogollon ceramics is made by Vaillant, who recognizes certain similarities between the Mogollon and pottery types in Mexico.* In 1932 Vaillant¹⁴⁶ suggested that it would not be too far fetched to suggest that the pressure of the Nahua tribes in Vera Cruz dislocated the Huastec away from the main Maya stem and started them drifting northward, and some groups may have reached the swamps of Louisiana and passed into the west Mississippi region. Although this contention is highly conjectural, there are some evidences, primarily ceramic, in its favor. The tripod bowls and bottle-neck vessels of the Mississippi are suspiciously like those of Central America; the modeled animal forms in the western Mississippi drainage are similar to those of San Salvador and in the middle Mississippi there is a development of vessels made in the form of the human head which are paralleled only by those in Costa Rica and Peru.

It is my belief that some such movement as this may be responsible for the distinctive character of the Mogollon ceramics, although certainly the movement is not the same as that which gave rise to the Mississippi valley wares. In view of the recent developments indicating an early age for some Mogollon ceramics, it is likely that the influences reaching New Mexico and Arizona represent an earlier migration, while the Mississippi groups arrived after a later thrust had put them on the march. This be-

145. Gladwin, Haury, Sayles and Gladwin, 1937; Gladwin, 1937.

* Correspondence with Haury.

146. Vaillant, 1932.

lief is substantiated by the comparative recentness of Middle Mississippi pottery when compared with the basic and apparently ancestral Central American forms. The Mogollon pottery is also earlier, strengthening the belief that it reached its destination prior to the Middle Mississippi thrust. The apparently early Nebraska cultures may represent a group originally contemporaneous with the Mogollon offshoot, which went around the coast and entered the Mississippi valley only when later invasions pushed them westward.

Once established in the Southwest the Mogollon pottery developed under pressure of Basketmaker-Pueblo influence and in the San Francisco and Three Circle phases some Hohokam influence was felt, thus bringing it farther away from its basic character. To definitely establish the validity of any theory on the ultimate origin of the Mogollon ceramics considerable work must be done along the Mexican and Texas coasts, further work in central Texas, and the location of definitely contemporaneous horizons in the Southeast.

It is my belief that the first settlements made in New Mexico by the Mogollon peoples took place between the years 700 and 900 A.D. This is in contradiction to Haury¹⁴⁷ who is of the belief that the Georgetown phase correlates with Basketmaker III, and to Gladwin,¹⁴⁸ who arbitrarily allows 200 years for each phase of the Mogollon and dates the Georgetown phase between 500 and 700 A.D. Frankly, I cannot see the basis for the assumed great age for the Mogollon. The only valid basis of dating is from the series of wood dates which we now have. A total of thirty-two wood specimens are known from the Mogollon, Harris, and Starkweather ruins and their dates range from 898 to 927 A.D. It is true that certain ceramic types like the Mogollon are intrusive in the lower levels at Snaketown and there assumed to date between 100 and 300 A.D. but from this we can hardly fix the date of the Mogollon culture. The Mogollon complex is composed of many elements in addition to pottery, none of which have found their way into the lower levels of Snaketown. It is one thing to speak of the age of ceramic types but quite another to speak of the age of a culture complex like the Mogollon. It is hard to grasp a long Georgetown period such as that postulated by Gladwin and Haury. It seems to me that in none of these ruins were changes so marked that they could not have taken place within two centuries time. From wood dates alone the San Francisco phase appears to belong in late Pueblo I and in checking over all

147. Haury, 1936.

148. Gladwin, 1937.

angles of the problem I cannot see where we could possibly place the Georgetown phase any farther back than 700 A.D. at the most.

Of particular significance is the peripheral location of the Mogollon culture with regard to the Basketmaker-Pueblo and Hohokam centers. The Mogollon were open to influences from two directions and I am inclined to believe that instead of a long Georgetown period such as that postulated by Haury and Gladwin we have the brief beginnings of the San Francisco which was modified by a Colonial Hohokam house type coming in. The architectural analogy between the Colonial Hohokam and the San Francisco is very close and the suggested influence takes on more significance when there are other elements such as shell ornaments, stone vessels, and ceramic colors which are broadly similar. Northern influences are also to be seen in house types, ceramics, and minor artifacts.

I would not say that some of the elements, such as plain and red wares, could not be older than the date indicated above, but, so far, the entire Mogollon complex has not been shown to be older. The fact that Gladwin has found plain and red wares similar to Mogollon in the early levels of Snaketown can be better interpreted as signifying that the two groups received ceramic types from the same source.

APPENDIX I.

STARKWEATHER POTTERY TYPES

A. Pithouse

1. Mogollon red-on-brown

Color: Red to brown paint on a slip ranging from brown and pink to slaty-gray.

Vessel Shapes: Bowls and jars with former predominating.

Treatment: Quartz sand and crushed rock temper. Interior of bowls slipped and polished resulting in blurred designs. Exterior slipped and shows bumpy unevenness with occasional scoring.

Design: Predominately rectilinear and carried up to rim. All-over design is characteristic. Occasional concentric lines. Brush work often crude.

Remarks: Ancestral to Three Circle red-on-white. Wood dates place its age between 898-927 A.D. Phase: San Francisco and Three Circle.

2. Three Circle red-on-white

Color: Dark red paint on a slip ranging from slaty-gray to white.

Vessel Shapes: Bowls.

Treatment: Temper like Mogollon red-on-brown, but finer particles. Interior slipped in heavy white and decorated with red lines, polished. Bowl exteriors are scraped, some scored.

Design: Brush work superior to Mogollon red-on-brown, and designs similar with greater tendency to be curvilinear. Triangles with serrated edges, parallel lines and scrolls.

Remarks: Descended from Mogollon red-on-brown and ancestral to Mimbres Bold Face black-on-white. Phase: San Francisco and Three Circle.

3. San Francisco Red

Color: Brown to red.

Vessel Shapes: Bowls, small ollas, eccentric (?)

Treatment: Temper of angular crushed stone. Bowl interiors smoothed, slipped and polished. Exterior slipped and often shows bumpy surface and striations.

Design: None.

Remarks: Ancestral to the later pueblo red wares at Starkweather and the Upper Gila district. Phase: Georgetown and all later phases. Intrusive in early levels at Snaketown.

4. Alma Plain

Color: Buff to red-brown.

Vessel Shapes: Bowls, jars, seed-jars.

Treatment: Temper consists of angular crushed rock. Unslipped. Walls uneven. Interiors scraped and partially polished. No smudging on interiors. Exterior smoothed, but not polished.

Design: None.

Remarks: Ancestral to Reserve Plain ware of Starkweather and Upper Gila area. Also the basic ware from which was derived the textured types. Phase: Georgetown, San Francisco, Three Circle.

5. Alma Neck Banded

Color: Buff to red-brown.

Vessel Shapes: Jars, pitchers.

Treatment: Temper consists of heterogeneous materials. Unslipped. Interiors scraped. Exterior smoothed with neck made up of wide coils which overlap narrowly. No polishing. Phase: San Francisco.

Design: None.

Remarks: Descended from Alma Plain.

6. Alma Punched

Color: Dark brown to black.

Vessel Shapes: Jars. Bowls questionable.

Treatment: Temper consists of crushed rock. Unslipped. Interior is uneven and rough; exterior partially smoothed with all-over design of indentations made with pointed implement. Exterior unintentionally smudged.

Design: Tool-made indentations.

Remarks: Related to, and probably descended from, Alma Plain. Phase: Late Georgetown, San Francisco.

7. Alma Scored

Color: Dark brown to black.

Vessel Shapes: Jars.

Treatment: Tempering of crushed rock. Surface irregularly scored.

Remarks: Related to, and probably descended from Alma Plain. Phase: Georgetown, San Francisco.

8. Alma or Reserve Incised

Color: Dark smudged.

Vessel Shapes: Jars—with flat bottoms.

Treatment: Tempered with coarse angular rock. Exterior lumpy, with or without coiling at neck. Marked with crudely incised elements consisting of crosses, parallel lines.

Remarks: Related to, and probably descended from, Alma Plain. Phase: Georgetown and subsequent phases.

B. Pueblo**1. Reserve black-on-white**

Color: Dense black paint on white slip.

Vessel Shapes: Bowls, pitchers, jugs, and eccetric forms. Pitchers with flat handles predominate.

Treatment: Brush work mediocre. Slip is bright and paint a clear black. Paint is of carbon and iron class.

Design: On interior of bowls; exterior of all other shapes.

a. Panels of longitudinal hatching.

b. Angular and curved elements solid and balanced by like solid elements. Balanced solid and hatched elements rare.

c. Triangles pendant from rims.

d. All-over design frequent.

Remarks: This ware is closely related to the Puerco black-on-white of the Little Colorado, from which it is probably derived. Ancestral to classic Tularosa black-on-white.

2. Tularosa black-on-white

Color: Dense black paint on a bright white slip.

Vessel Shapes: Bowls, pitchers, jugs, ladles, and eccentric forms. Pitchers with flat or round handles, often modified into form of animal, predominate.

Treatment: Brush work is exact. Slip on interior and exterior; paint is clear black.

Design: Interior of bowls and ladles; exterior of pitchers, jugs, and eccentric forms.

- a. Angular and curvilinear designs covering large part of bowl interiors and body, shoulder and neck of pitchers.
- b. Interlocking designs composed of balanced solid and hatched elements.
- c. Hatching is oblique.
- d. Close-set small key figures.
- e. Fine herring bone work in black lines.

Remarks: This ware is descended from Reserve black-on-white and is closely related to certain Colorado wares as Puerco black-on-white and Roosevelt black-on-white.

3. Reserve Polychrome

Color: Brown to red-brown exterior, polished black interior, decoration with white paint.

Vessel Shapes: Bowls.

Treatment: Temper consists of fine heterogeneous materials. Interior smudged and highly polished. Exterior smoothed and polished. Fillet rim common. White paint decoration.

Design: Exterior of bowls and occasionally the interior but never on both surfaces. Designs consist of solid stepped elements, and solid rectilinear lines ending in key. Design is enclosed within encircling bands near bottom and just below rim. Excellent brush work.

Remarks: A development out of Reserve Plain ware through influence of St. Johns Polychrome. The white paint appears to be an imitation of the latter.

4. Reserve Plain Ware

Color: Brown to smudged-black exterior, polished black interior.

Vessel Shapes: Shallow bowls, jugs. Bowls often have convex to flat bottom.

Treatment: Tempered with angular heterogeneous materials. Interior smudged and highly polished to produce a lustrous surface. Exterior unslipped but highly smoothed and occasionally polished. Interior smudging may continue to base of rim on exterior. Rim often the fillet type.

Design: Fire-clouds may be present although this feature is rare.

Remarks: Probably descended from Alma Plain and ancestral to Reserve Polychrome. Confined to Pueblo phase at Starkweather.

5. Upper Gila Corrugated

Color: Various shades of brown to black on exterior. Interior of bowls smudged and polished.

Vessel Shapes: Bowls, jugs, large ollas. Bowls are variable in form running from shallow bowls to deep bowls with straight

sides and flat to convex bottoms. Jugs are small, ollas very large.

Treatment: Temper consists of fine materials, primarily sand. Interior of bowls smudged and polished; exterior shows all-over coiling. Coils frequently indented or waved to produce decorative effect. Smudging often occurs at rim on exterior. Coils of ollas narrow and wiped. On jugs the corrugation may be confined to neck and shoulder. Incised lines over coils is rare.

Design: Indentation and waving of coils to produce star patterns. Occasional incised lines.

Remarks: A companion ware to the Reserve Plain and probably a late descendant from Alma Plain. Related to corrugated wares of the Little Colorado and Middle Gila. Confined to the Pueblo phase at Starkweather.

6. Reserve Red Ware

This ware is usually found as a companion-ware to Reserve black-on-white. It is an outgrowth of San Francisco Red and in most cases the two are not distinguishable. Some new forms are added such as seed-bowls, ladles, and globular jars with restricted orifice. Bowls with fillet-rim are common and fire-clouds appear on bowl exteriors. Because of over-lapping features, neither this ware nor San Francisco Red can be safely used as horizon indicators.

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View of Starkweather Ruin from the south. The photographic tower is located near the center of the ruin.

THE STARKWEATHER RUIN

Plate 2.



- a. *East part of ruin before excavation. Here were found most of the 18 pithouses.*
- b. *View of Pithouses Nos. A, C, D.*

TYPICAL MOGOLLON HOUSE TYPES

Plate 3.



a. House F partially excavated. Type I, Georgetown Phase.

b. House F excavated. Type I, Georgetown Phase.

TYPICAL MOGOLLON HOUSE TYPES

Plate 4.



- a. *Type II pithouse. Round with roof entrance. (Room K). San Francisco Phase.*
- b. *Surface rooms built over Pithouse N, a Type II house. San Francisco Phase.*

TYPICAL MOGOLLON HOUSE TYPES

Plate 5.



- a. Type III pithouses. Houses H and J. Rectangular with side entrance.
- b. Type III pithouses. Showing floor features of House J.

TYPICAL MOGOLLON HOUSE TYPES

Plate 6.



a. Type IV house, ceremonial. House B partially excavated.

b. Type IV house, ceremonial. House B completely excavated.

MOGOLLON PITHOUSES

Plate 7.



a. Pithouse Q lying below Surface Room 9.

b. Pithouse R lying below Surface Room 10.

MOGOLLON PITHOUSES

Plate II



- a. Pueblo structure built over earlier Pithouse Q.*
b. Pithouse No. P lying below Surface Room 8.

MOGOLLON PITHOUSES

Plate 9.



- a. West wall of Pithouse A, showing native subsoil. Absence of wall plaster.*
b. Bowl inverted over an olla in upper fill of Pithouse A.

PUEBLO MASONRY AND PITHOUSE MILLING STONES

Plate 10.



- a. West wall of Surface Room No. 9, showing dry stone technic in masonry and use of true and false spalls.
- b. Metate, manos, and rubbing stones from Pithouse No. G. Metate and disc-shape manos are from floor, others from upper levels.

STARKWEATHER PUEBLO STRUCTURE

Plate 11.



- a. Upper Gila pueblo structure. Looking north: Rooms 1, 2, 3, 4 at left; at right Rooms 9, 8, 7, 6, 5.
- b. Same rooms looking south. Rooms 4, 3, 2, 1 at right; at left Rooms 5, 6, 7, 8, 9.

STARKWEATHER PUEBLO STRUCTURE

Plate 12.



- a. Left foreground, Surface Room No. 3 constructed over an earlier pithouse.
b. Surface Room No. 2, showing details of fireplace, ventilator, and masonry.

STARKWEATHER PUEBLO STRUCTURE

Plate 11



- a. Surface Rooms Nos. 5 and 6, showing storage bin in Room 5.
- b. Surface Room No. 5. Corrugated olla in situ. The olla contained three turquoise beads and flakes of obsidian.

STARKWEATHER PUEBLO STRUCTURE

Plate 14.



- a. Surface Room No. 6, showing Pithouse N, storage pits, metates, fireplace, deflector, and ventilator which runs half the length of room and through wall into Room No. 5.
- b. Southwest corner of Room 5, showing origin of ventilator, which runs to Room 6, and its stone construction above and below the floor.

STARKWEATHER PUEBLO STRUCTURE

Plate 15



- a. Northwest corner of Room No. 6, showing metates with bowls.*
b. Unidentified symbol cut into floor of Room No. 6. Bone awl in situ.

STARKWEATHER PUEBLO STRUCTURE

Plate 16



- a. *The inter-room entrance connecting Surface Rooms Nos. 8 and 9.*
- b. *Carved stone slab in situ at entrance connecting Surface Rooms 8 and 9. Probably used to seal entryway.*

STARKWEATHER PUEBLO STRUCTURE

Plate 17.



- a. Doorway connecting Rooms 3 and 4. Walls show irregular-coursed stones.
- b. Closeup of above doorway showing the use of pottery sherds for spalling. Some are Mogollon sherds picked up from the ruin by the later pueblo dwellers.

STARKWEATHER PUEBLO STRUCTURE

Plate 18.



- a. *Masonry of Room No. 2, southwest corner. Photographed from distance of 2 feet 8 inches.*
- b. *Wall stones which made up section shown above in a. Revealing the interior construction.*

PITHOUSE BURIALS

Plate 19.



a. Burial 30. Below floor of Pithouse C.

b. Burial 53. Below floor of Pithouse R.

BURIALS IN FILL OF PITHOUSE

Plate 20.



a. Burial 29 in fill of Pithouse C.
b. Burial 45 in fill of Pithouse I.

TYPICAL UPPER GILA BURIAL POSITIONS

Plate 21.



a. *Semi-flexed on back.* (Burial No. 3).

b. *Semi-flexed on back.* (Burial No. 4).

TYPICAL UPPER GILA BURIAL POSITIONS

Plate 22.



a. *Semi-flexed on back.* (Burials Nos. 5 and 6).

b. *Closely-flexed on back.* (Burial No. 7).

TYPICAL UPPER GILA BURIAL POSITIONS

Plate 23.



a. *Semi-flexed on back.* (Burial No. 11).

b. *Semi-flexed on back.* (Burial No. 18).

TYPICAL UPPER GILA BURIAL POSITIONS

Plate 24.



- a. *Semi-flexed on side.* (Burial No. 20).
b. *Closely-flexed on back.* (Burial No. 27).

MORTUARY OFFERINGS WITH PUEBLO BURIALS

Plate 25.



- a. Mortuary pottery with burial No. 32. Bowl inverted over head is killed.
b. Mortuary offering of bowl enclosing a coiled basket.

PITHOUSE POTTERY

Plate 26.



Design Elements. Mogollon Red-on-brown.

PITHOUSE POTTERY

Plate 27



Design Elements. Three Circle Red-on-white.

PITHOUSE POTTERY

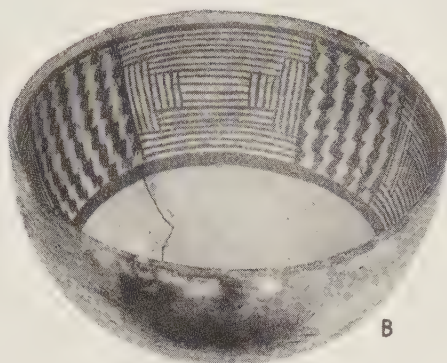
Plate 28.



Mogollon Plain and Textured Wares. a, b, c—Alma plain; d, e, f, g, h—Incised corrugated; i, j—Alma punched; k—Alma scored; l, m, n—Alma neck-banded.



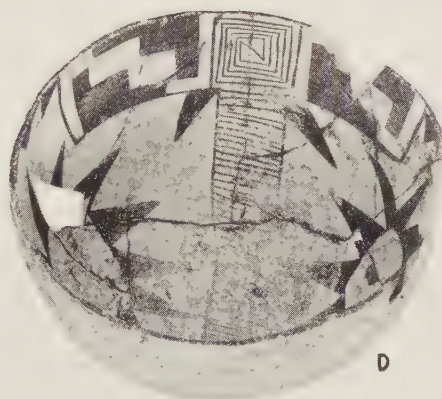
A



B



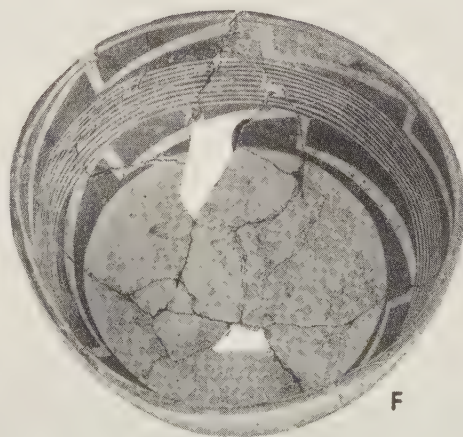
C



D



E



F



A



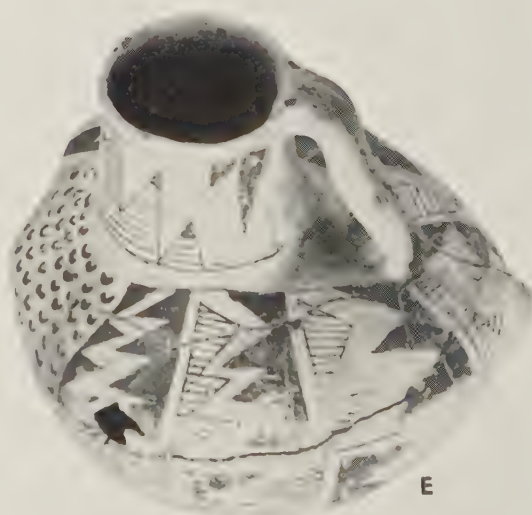
B



C



D



E



Reserve Black-on-white Pitchers.



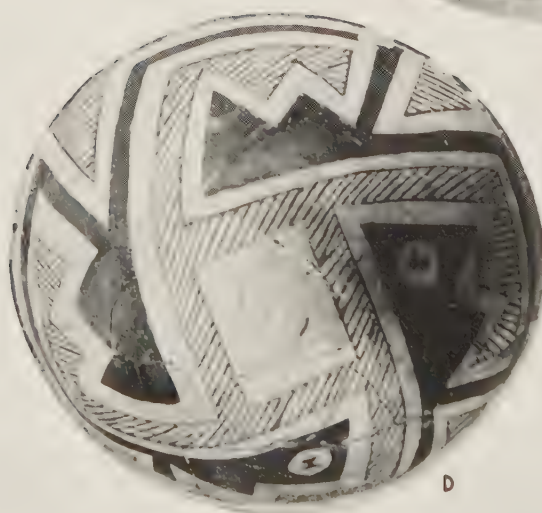
A



B



C



D



E

Tularosa Black-on-white Bowls.



A



B



C



D



E



F



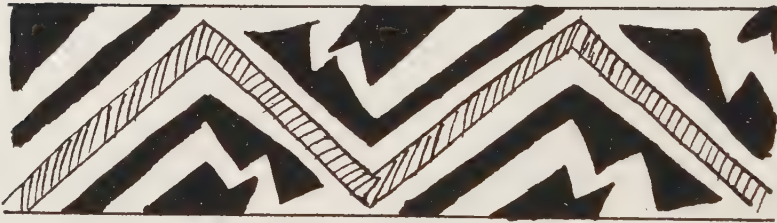
G



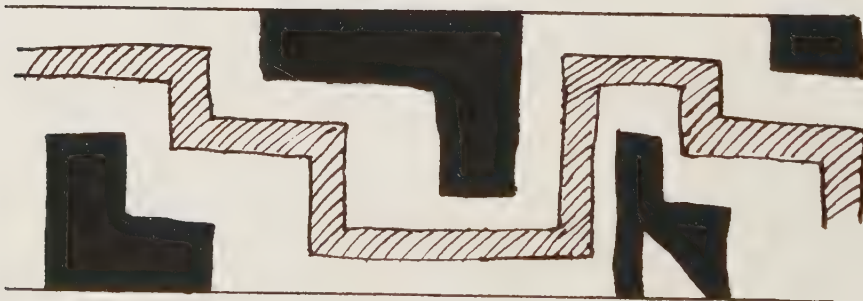
a



b



c



d

Design Elements on Black-on-white Pitchers.

- a. Vertical hatchings
- b. Opposed solid figures.
- c. Balanced solid and hatched elements.
- d. Oblique hatching with opposed solid elements.



Reserve Plain Ware Bowls.

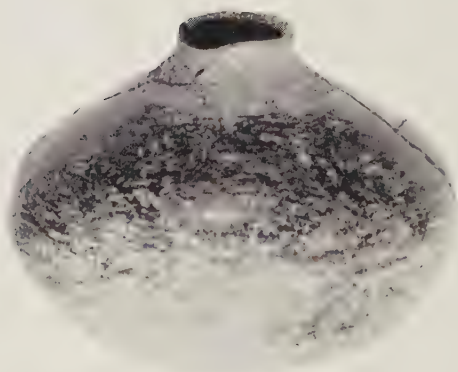


Reserve Plain Ware Bowls.

Plate 37.



a—Alma Scored Jug; b—Reserve Polychrome Bowl; c, d—Reserve Polychrome Sherds.





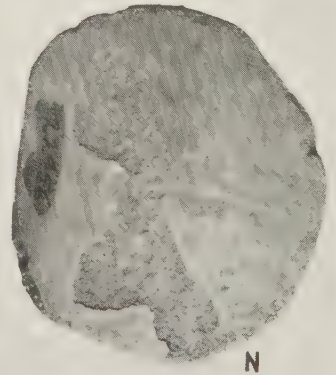
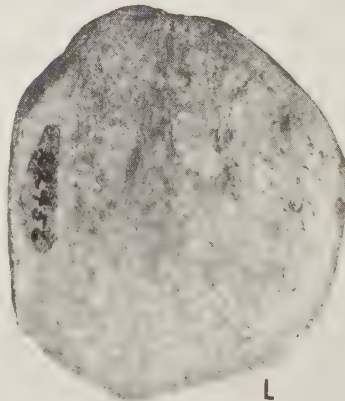
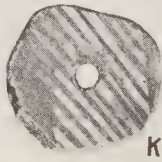
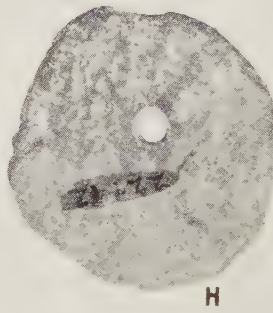
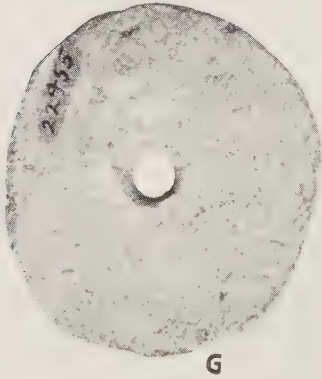
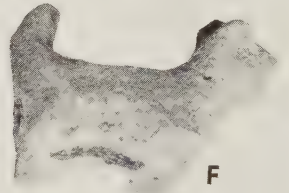
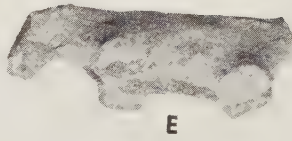
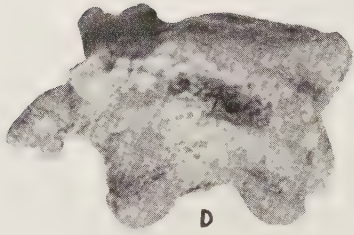
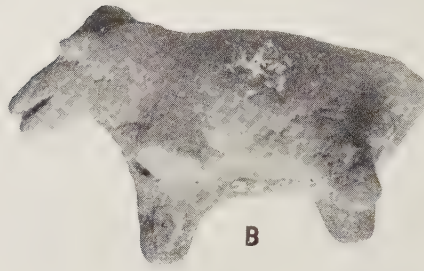
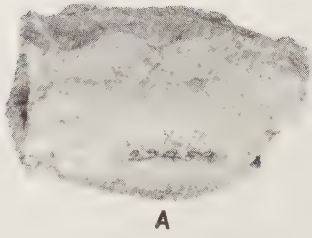
Upper Gila Corrugated Vessel Forms.



Upper Gila Corrugated Vessel Forms.

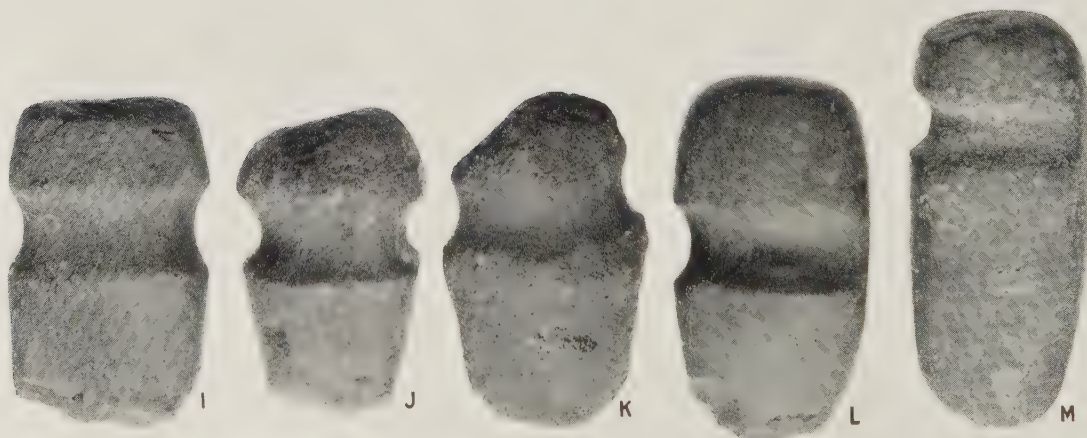
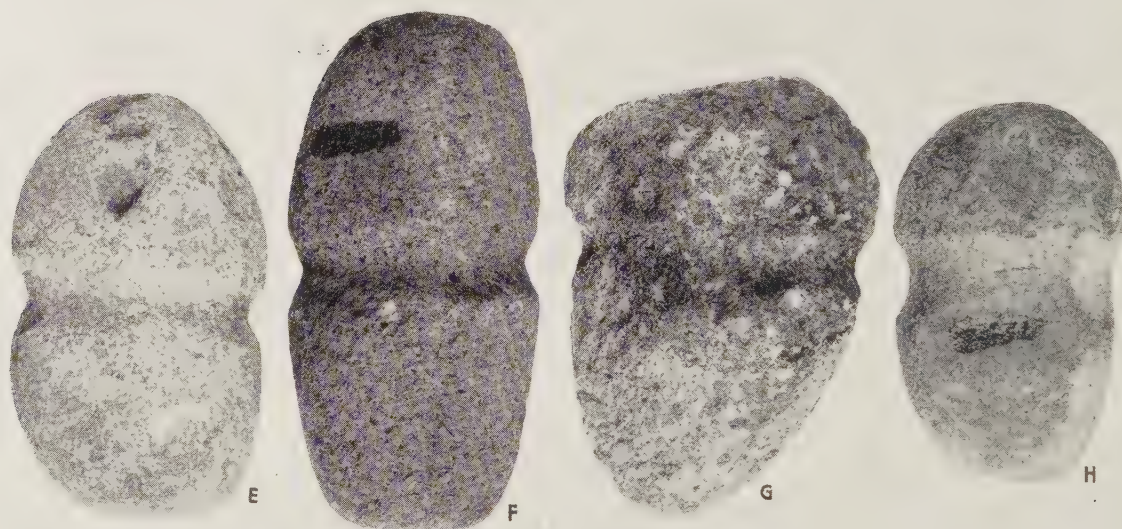
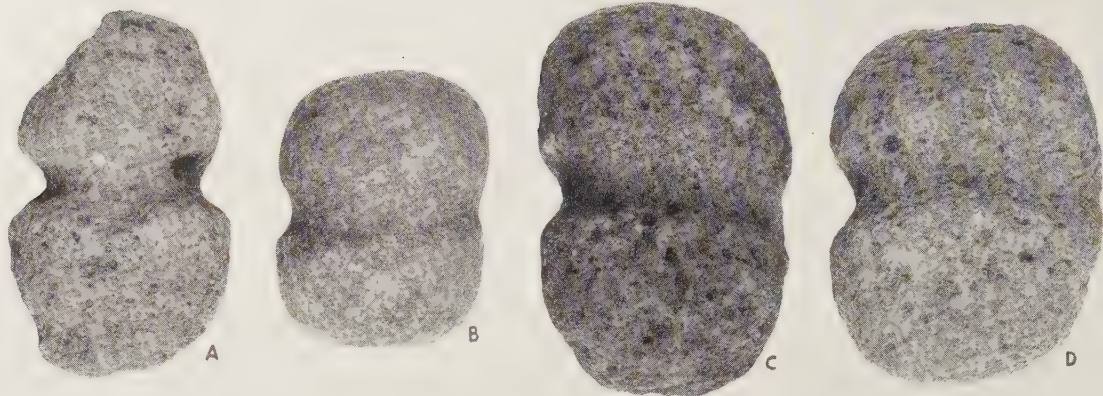


Intrusive Pottery: Pueblo. a, b, c, d, e, f—Mimbres Bold Face Black-on-white; g, h—Showlow Black-on-red; i, j—Houck Polychrome; l—Mimbres Polychrome. m, n—Wingate Black-on-red.





Characteristic Mano Forms. a, b, c, d, e, f, g—Pithouse manos. h, i, j, k—Pueblo manos.



*Mauls and Axes. a, b, c, d—Pithouse mauls. e, f, g—Pueblo mauls.
h, i, j, k—Pithouse axes. l, m—Pueblo axes.*



Stone Bowls, Pipes, and Abrading Stones. (Pithouse and Pueblo).

Plate 46.



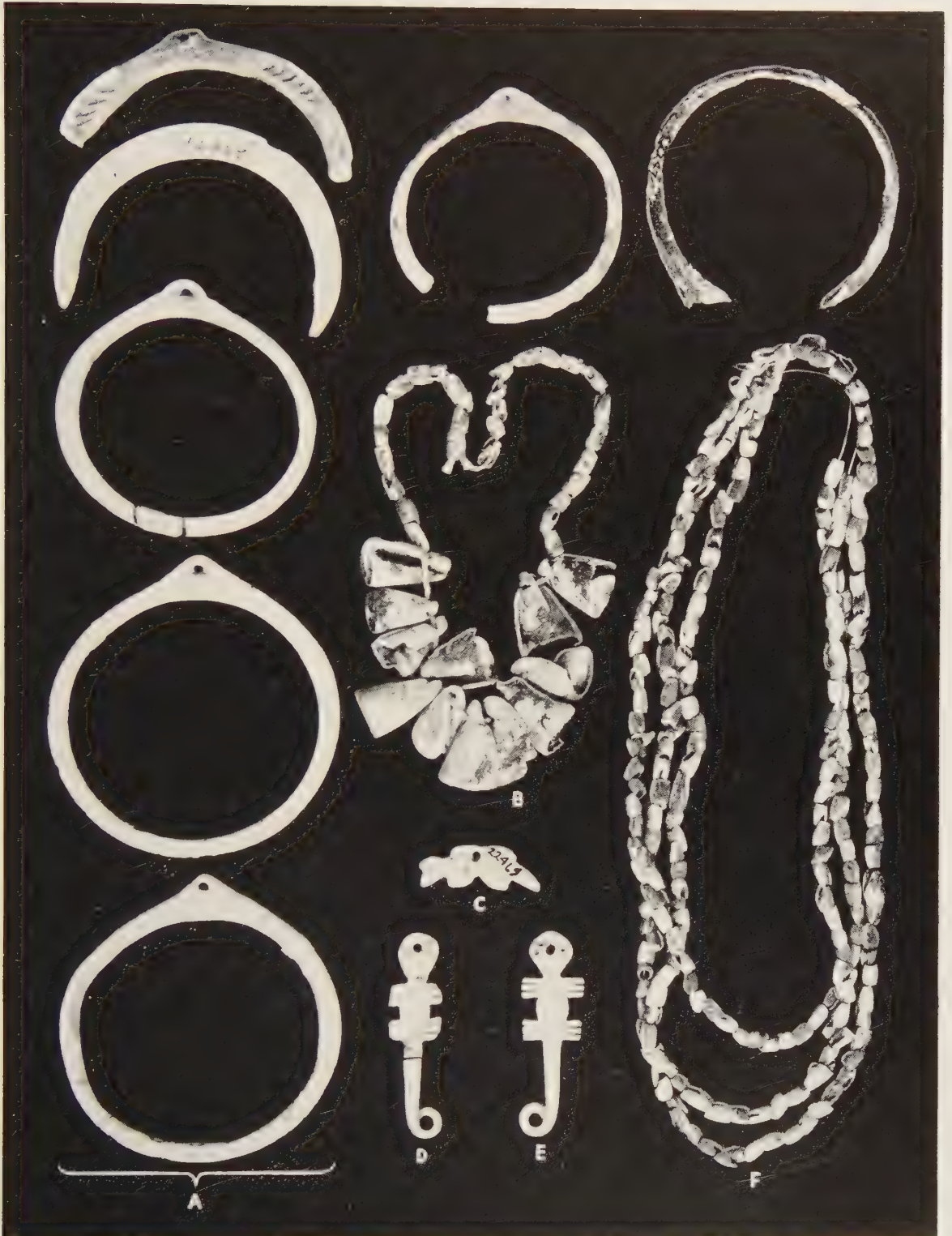
Sandstone Paddle (Pueblo).



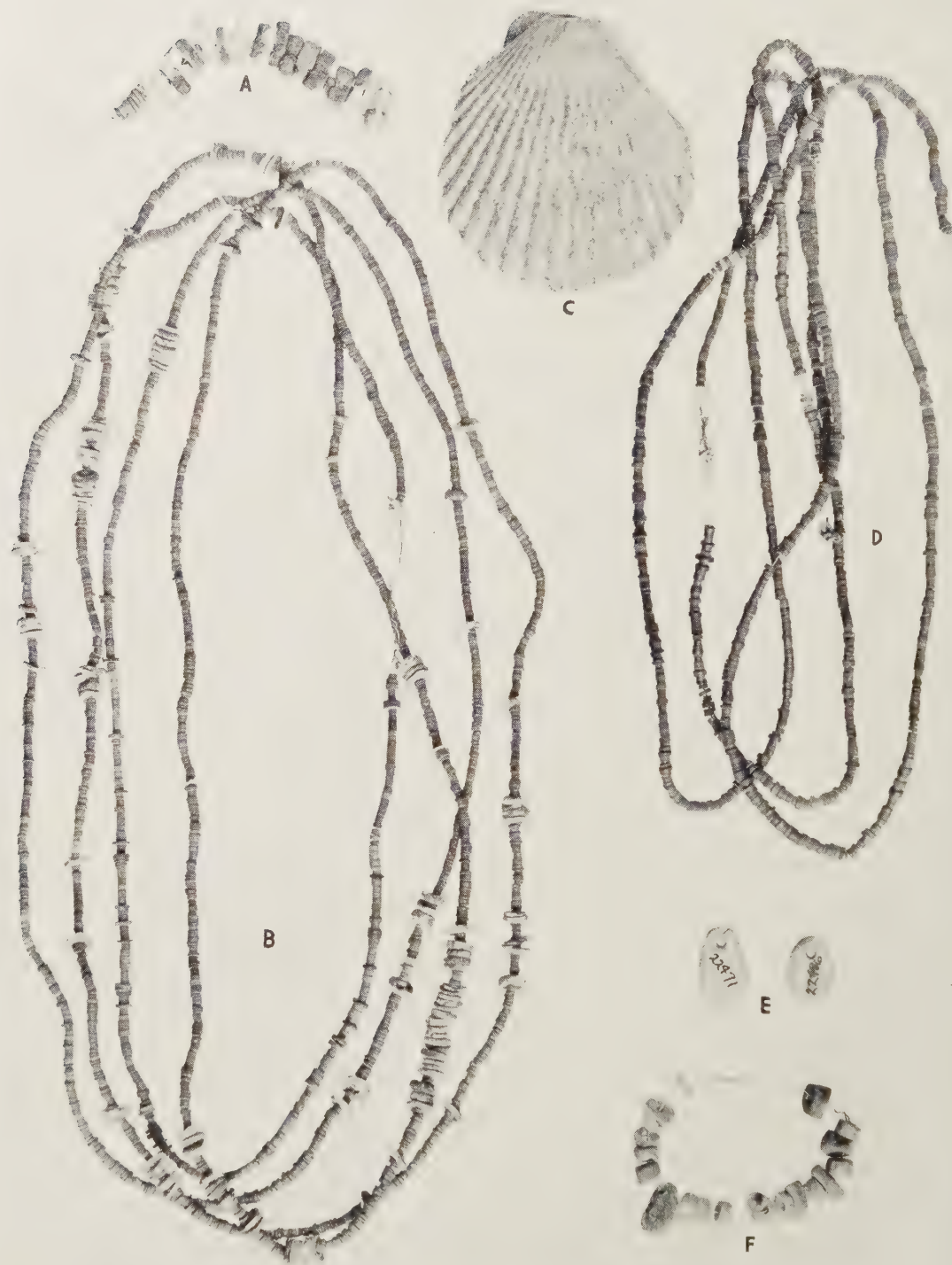
Chipped Implements. (All from Pithouses except Group B, which are from the Pueblo).



Bone Implements. a to e—from Pithouses. f to o—from the Pueblo.



Shell Bracelets, Pendants, and Beads. (Pueblo).



Shell Pendant and Minute Stone and Shell Beads. (Pueblo).

STARKWEATHER RUIN

.... Reserve, New Mexico

Legend:-

PITROOMS - A to T

STONE HOUSES - 1 to 12

BURIALS - ① to ⑤⑤

Not Excavated

5 meters

